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Researcher Killed in Wisconsin

Bomb Demolishes Army Computer Complex

Every window is blown out in the bomb-damaged Army Mathematics Research Center at the University of Wisconsin. The explosion ripped through the six floors of the building. (CW photo by Thomas Morton)

By Thomas J. Morton
CW Midwest Bureau

MADISON, Wis. – In the aftermath of the bombing of the U.S. Army Mathematics Research Center building at the University of Wisconsin, one man lay dead, three others were injured, $1.5 million of computers were demolished, 13 years of work and over 1.3 million manhours and nearly 20 years of data collected by a staff of mathematicians and DP professionals were obliterated.

Two minutes before the explosion a phone call warned local police.

The next day the staff of the computer center four and one-half blocks away from the bombsite was evacuated while police searched the building for a second bomb.

But there was no second bomb.

There didn't have to be, Monday's did enough in havoc and in terror.

"We felt sure the second bomb call was a trap," a young police officer told CW, "and most of us (the federal and state investigators on the Madison bombing case) think Monday's was too. Nobody sets a bomb for three forty-two. We think the phone call was a set-up. If that bomb had gone off in 10 minutes instead of two, that building would have been loaded with cops and firemen.

Researcher Killed

Dead instead was a researcher, Robert Fassnacht, 33, the young father of three children, who was working late in the Army Math Center to finish his assignment so he could begin his vacation on schedule.

The bomb, according to investigating FBI agents, was a van loaded with dynamite that had been placed against the south wall of the Math Research Center.

The bomb tore out approximately one-third of that wall and ripped up through the six reinforced concrete floors of the building. The computer center for the Army complex was housed on the third floor of the building.

Computers 'Demolished'

A fire official at the scene, when asked about the damage to the computer center, said that the equipment was "demolished." A police officer at the scene said "There might have been computers up there once, but they're not up there now."

Wayne Rayfield of the Research Center said that he could not say exactly what damage the equipment had suffered because neither he nor his staff had been allowed into the ruined building. He said that he was not optimistic.

The center contained a CDC system with a 3600, eight tape drives, and three drums along with a 924 optical scanner. Also, a Univac 9300 was an on-line terminal to a Univac 1108 in the university's data center blocks away. There was also a small system built around a Honeywell DDP 124, and another around a Scientific Control Corp. 4700.

Estimates of the total damage to the Math Research Center computer complex have been set at $1.5 million. Damage to the building, which also housed a nuclear accelerator in the physics department basement labs, has been appraised at between $5 million and $6 million. The main framework and housing of the nuclear accelerator escaped major destruction in the explosion.

A graduate student who works in the research center explained that most of the current research programs did not have back-up. He said that the programs, a lot of them still in the initial stages, were more studies on the solution to problems than the solutions themselves.

(Continued on Page 4)

Telex Drives, Controllers Offer User Lower Cost

By Frank Piasta
CW Staff Writer

TULSA, Okla. – Savings up to 53% on purchased equipment and 44% on leased devices, depending on configuration, are available to 360 and 370 users who install magnetic tape drives and controllers from Telex to replace comparable IBM units.

The addition of the 5803-1 and 5803-2 Tape Control Units to its line of magnetic tape drives allows Telex to offer the user a complete tape subsystem that Telex said provides improved performance at reduced cost.

In addition to the controllers, Telex is making available three additional models of its 5400 series 360-compatible magnetic tape drives 5420-5, 5421-5, and 5421-6.

Both versions of the Telex 5803 controller are plug-to-plug replacements for the IBM 2803. The controllers offer multiple interface switching, and cabinets half the size of the IBM units. Four data rates, available when the Model 2 controller is used with the two new Telex drives, are not offered by IBM. The byte/sec rates are 100K, 120K, 200K and 240K byte/sec.

5803-1 Tape Controller

The Telex 5803-1 can be used to control up to eight Telex tape drives, Models 4811, 4812, 4822, 4831, 4852 or 4862, in any combination of models and/or recording densities. The units can be directly connected to IBM 360 and 370 I/O interfaces.

In a standard configuration, the 5803-1 controls reading and writing of data on nine tracks at 800 bit/in. or 1,600 bit/in. Addition of optional features expands the capability to 7-track, 200 bit/in., 556 bit/in., and 800 bit/in. Data converter and translator functions are optionally available.

A 2-channel switch feature provides the ability to connect the 5803-1 to two selector channels thereby interconnecting the attached tape drives to two computer systems.

The Model 5803-2 Tape Control Unit provides the same capa-

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Protest, Enthusiasm Greet ACM Opening

By Edward Bride and Joseph Hanlon
CW Staff Writers

NEW YORK – Enthusiasm, encouragement, questions, and protest surrounded ACM officials as they completed preparations for the "unconventional convention," slated for the New York Hilton this week.

Questions and protest came from interested groups like the Computer Professionals for Peace and welfare organizations, who complained of the cost of complete registration, $35 for one day, $85 for the entire conference for non-ACM members.

Enthusiasm and encouragement came from within the organization and without. People like Walter M. Carlson, president of the Association for Computing Machinery, who was "quite relaxed" that the conference would present a broad, appropriate viewpoint for the general public to become acquainted with the technology.

Conference Chairman Sam M. Matsa encouraged members to "get involved" with the problems of mankind, and to use their knowledge to help solve them.

Mayor John V. Lindsay, noting "the data processing industry has created more than a million jobs – most of which didn't even exist" during the development of the first computer, proclaimed this "New York Computer Week" in his welcome to the conference.

Keynote speaker Ralph Nader was expected to criticize misuse of computers in credit card and billing systems. The lawyer and consumer advocate has been prolific in exposing the consumer hazards of many industries, and the computer trade has been one of his latest targets.

His chief complaint has been that the computer affords the opportunity for people to blame machines for their own human errors.

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Jane Makes Army List

Jane Fonda, shown here in a scene from the film "They Shoot Horses, Don't They?", is now listed in the Army's computer data bank of civilian political activity. (See story on Page 2)

Army Transfers Data Bank Control to Ciad

By Joseph Hanlon
CW Staff Writer

ALEXANDRIA, Va. – Movie actress Jane Fonda has been added to the Army's computerized data bank of civilian political activity. Meanwhile, control of the data bank has been shifted to a new Army group.

The data bank is maintained because the Army "must be in a position to analyze information in order to prepare necessary civil disturbance plans" in case troops are needed to quell disturbances, according to Under Secretary of the Army Thaddeus R. Beal.

5,000 Civilians

But other sources within the Army report that many of the 3,000 to 5,000 civilians in the computer file have no conceivable relation to potential riots. Typical listings are folksingers Judy Collins and Pete Seeger, two ex-military officers who have spoken out against the war in Indochina, and a Baptist minister who writes anti-Semitic letters.

Jane Fonda, star of "Barbarella" and "They Shoot Horses, Don't They?", was added to the file early this summer. The Army declined comment, but apparently she was added because she joined a group of 100 Indians who attempted to enter Fort Lawton, Wash., March 9, to set up an Indian Cultural Center.

Control Transferred

The data bank is maintained by the Counterespionage/Countersubversion Section (CE/CSS) of the Army Counterintelligence Analysis Detachment (Ciad). Until recently, however, the CE/CSS worked directly under the Directorate of Civil Disturbance Planning and Operation in the Pentagon Domestic War Room under the Pentagon parking lot.

Now, the Army has transferred control of CE/CSS back to Ciad and its staff no longer works in the Domestic War Room.

The data bank itself is in the Hoffman Building, 3601 Eisenhower Dr., Alexandria, Va., not in the Domestic War Room as was reported in CW Aug. 12. But the staff of the Domestic War Room has access to the data bank, even though CE/CSS is no longer working there.

Protests Responsible?

Earlier this year, the Army collected data on civilian political activity in at least four computerized data banks. When this became public, the ensuing uproar forced the Army to discontinue two of the data banks. Recently, the Army "found" another data bank, and discontinued it [CW, Aug. 12]. The Ciad-CE/CSS data bank is the only one remaining, and the change in authority may have been an attempt to reduce objections.

The Ciad-CE/CSS data bank consists of microfilmed newspaper clippings and FBI and military intelligence reports, indexed by computer.

Top Management Use of Computers Lags In U.S. Companies, Says McKinsey Head

TOKYO – U.S. business and industry have tripled their spending for computer operations in the past five years, but top managements have barely increased their use of computer resources, a McKinsey director told a group of corporate managers in Japan.

"Not only are top executives barely increasing their use of computer output, but they're also lagging behind in getting the right kind of output," David B. Hertz observed. "Today, most executives are receiving nothing but spin-off information from accounting-oriented data bases, such as sales summaries, product cost reports, and other after-the-fact information.

"What they should also be getting requires a more decision-oriented data base that can be used, for example, to identify potential market demands, to indicate improvements in operating costs, and to show profit profiles of alternative investment plans.

High-Technology

"The few companies that are taking the lead in building computer-based management information systems are largely in the high-technology industries such as aerospace, petroleum, and chemicals. The chief executive officers of many of these companies are taking effective steps in utilizing computers to gain 'management lead time' over competitors," said Hertz.

"These are the companies that originally developed and applied the techniques of operations research, systems analysis, and mathematical programming to their business operations. Now that they've proved the technological feasibility of utilizing computers in the management process, they're demonstrating the economic and operational feasibility of doing so," he explained.

"Most companies, however, are trailing their industry leaders in applying the computer sciences to the top management function of formulating corporate strategy, designing overall planning and control systems, and setting investment and growth policies. Executives of such companies are supporting computer operations for only short-term gains, not long-term ones. They're approving expenditures for computer systems that will improve the company's financial performance in a given fiscal year but overlooking the longer-term and more profitable applications," said Hertz.

Speaking at a two-day seminar which he conducted with the Japan Computer Usage Development Institute here, Hertz said that U.S. business and industry will spend about $25.5 billion to utilize computers in 1970. This figure has grown from $8.3 billion in 1965 and is expected to climb to about $51.5 billion in 1975. This year's spending, he said, includes $13 billion for internal operating costs, $8.3 billion for hardware and equipment, $2 billion for outside support services, $1.7 billion for outside software, and $.5 billion for outside information services.

"Throughout U.S. business and industry, the percentage of computer resources allocated to produce output for top management will average only 18% of the total this year, with 38% going to middle management and 44% to operating supervisors. The 18% figure is up only slightly from 14% in 1965 and will increase to no more than about 25% in 1975," Hertz told the audience.

To utilize computers more effectively, Hertz suggested, chief executives should address themselves to three basic issues: identifying those problems where the computer has greatest leverage on profits; planning and evaluating systems that will permit this leverage to be used; and implementing and directing the systems for timetable results.

CPP Asked ACM to Admit Public Free

(Continued from Page 1)

The Computer Professionals for Peace (CPP) claimed that the "high cost" of the technical sessions effectively excluded those affected by computers. CPP asked ACM to admit the public free to all sessions.

Sam M. Matsa, conference chairman, disagreed with CPP and refused the request. He indicated that the $35 one-day fee would remain in effect, along with the $2 general admission for the exhibits, town hall sessions, and some evening meetings.

Matsa explained that three reasons were behind the ACM position on refusing general admission free of charge:

- Part of the conference is already open to the public.
- Those who cannot afford the technical sessions would not benefit anyway (these sessions would be of primary interest to "administrators and researchers" rather than the general public, he claimed.
- ACM must charge because it needs the money to pay for the conference.

For the first time, the annual meeting – billed as the "unconventional convention" – has no commercial exhibits. The committee decided last Spring to have "public service" exhibits only and, therefore, provide space free of charge.

10,000 off the Street

Communications, the official ACM monthly magazine, predicted that 10,000 laymen would utilize the $2 opportunity to learn about the various effects which the new technology has to offer.

Among the scheduled exhibits is the Honeywell kitchen computer which, according to conference regulations, was "provided" booth space along with the non-commercial exhibitors. The theory is that none of the laymen could afford the $10,000 machine, but all would be "interested" in advances which it signifies, according to one ACM member.

Others scheduled for exhibits include the Dallas ACM chapter, contributing its newly developed set of panels showing the elements of computer operations to the nontechnical layman.

"Among the firsts," according to the ACM, is a demonstration of the "computer-controlled distribution of electric power in the Northeast U.S."

These exhibits, Matsa said, hold much more interest for the general public than, for instance, the technical session, "Computing and All the Disadvantaged in the Seventies." The chairman said that rather than go to this session, the disadvantaged should go to the open session on "Career Guidance for Non-College Students" and learn how to get into the computer trade.

Computer Center 'Invasion'

CPP disagreed with Matsa. It cited the "invasion" by Boston welfare recipients of the Welfare Department computer center [CW, July 15] as an example of interest in the effects of computers. CPP member Joan Dublin declared: "It is important to open a dialog with welfare people. They are obviously concerned but they don't understand the computers. ACM '70 could help them understand."

An ACM apologist in Boston countered that some needed education would be better aimed at the social workers, who "blamed" the local computer for holding back some 600 public assistance checks when, in fact, the workers themselves were charged with laxity in completing files.

Conference exhibits close Thursday afternoon Sept. 3, at 3 p.m.

Computer Helps Police Recover Stolen Autos

DETROIT – Local police are boasting a 97% recovery rate on stolen cars, thanks mostly to computerized law enforcement.

Detroit Police Inspector Jack P. Shoemaker recently noted that two former allies of crime, time and distance, are no longer on the side of the criminal.

The arrests were made possible through the FBI's National Crime Information Center, and two regional law enforcement agencies, the Law Enforcement Information Network, and the Detroit Electronic Teleprocessing and Computer system.

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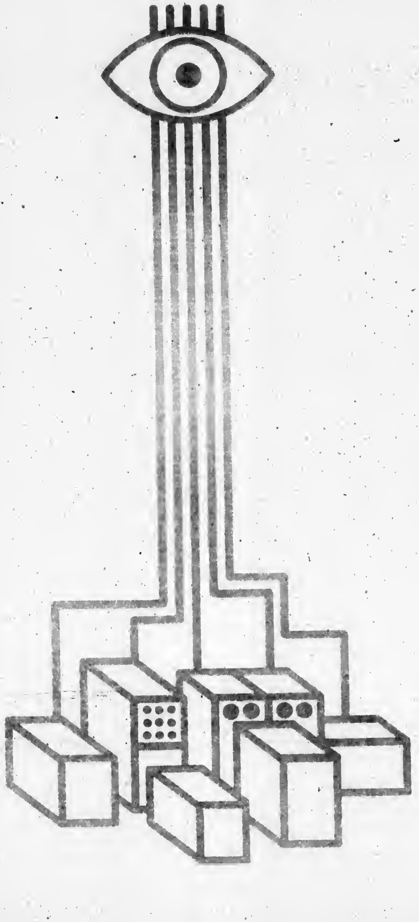

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Telex Drive, Controller Replacements May Improve Performance at Low Cost

(Continued from Page 1)

bilities in conjunction with both Telex 4800 and 5400 series tape drives. In a standard configuration, the 5803-2 controls reading and writing of data on nine tracks at 1,600 bit/in.

The addition of optional features expands the capability to 7- and/or 9-track, 800 bit/in. Also available are data converter and translator functions. The 5803-2 is also equipped with a 2-channel switch.

Tape Drives

The Telex 5420-5 tape drive is a replacement for IBM's 2420 Model 5 with a tape speed of 100 in./sec. Using a 9-track format, it offers data rates of 800 bit/in. and 1,600 bit/in. the 5420-5 is compatible with its IBM counterpart and operates with the IBM 2803 controller as well as with the new Telex 5803-2.

The 5421-5 and 5421-6 tape drives are designed to provide speeds not available from IBM units and are said to add data rate flexibility and increased throughput when used with the 5803-2 controller.

Identical to the Telex 5420-5 in size, track format, and data density, they offer tape speeds of .125 in./sec and 150 in./sec, respectively. This results in data access rates of 100K byte/sec and 200K byte/sec for the 5421-5 and 120K to 240K byte/sec for the 5421-6.

Delivery of the Telex 5420-5 will begin in December 1970. The 5421-5 and 5421-6 tape drives as well as the new 5803 Tape Control Units are scheduled for delivery during the second quarter of 1971.

Telex 5803-1 Tape Control Unit with Telex 4800 Series Magnetic Tape Drives.

Description	IBM No.	Telex No.	RENTAL ($)		Savings	PURCHASE ($)		Savings
			IBM	Telex		IBM	Telex	
Tape Control	2803-1	5803-1	650	350		30,670	12,500	
7-Track Compatibility	7125	5806	50	25		2,260	1,500	
2-Channel Switch	8100	5809	100	75		3,950	3,500	
Totals			800	450	44%	36,880	17,500	53%
Tape Control	2803-2	5803-2	800	800		37,735	43,500	
9-Track Compatibility	5320	5808	230	150		10,400	5,900	
2420 Attachment	7900	NC	340	NC		16,005	NC	
Totals			1,370	950	31%	64,140	49,400	23%
Tape Drive – 100 in./sec	2420-5	5420-5	565	510	10%	29,255	22,400	24%

Chart shows typical Telex tape drive configuration costs together with costs of comparable IBM equipment.

This Computer Program Has a Heart

CW West Coast Bureau

SACRAMENTO, Calif. – California has come up with a computer program with a heart. The adoption Resource Referral Center of the State Department of Social Welfare uses a computer to help match children with parents on a statewide basis. The example is cited where a Japanese-Caucasian child born in northern California is placed with a couple in southern California.

"Hand operation" was formerly the method but with 8,366 children relinquished for adoption in 1969, it was a difficult problem to match parents and children on a statewide basis. In the computer today are 495 children and 725 families on the active file.

The computer compares every child with every family. The social workers then take this information and refine it to find the most compatible match.

The office reports that it now receives about 500 printouts a week, but cautions that if a family is flexible in its requirements it may be matched with as many as 50 children.

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Army Computer Complex

Center Damage Estimated at $1.5. Million

(Continued from Page 1)

The programs that had been worked on the 1108 in the main computer center were still viable, he explained, but the programming for the 9300, especially the interrogations and output demands were, in his opinion, destroyed.

While back-up exists for some programs such as the program on radar jamming by nuclear explosions and the programs on satellite orbit plotting in the form of published papers or reports to the Army, CW learned, the actual working solution records are thought to have been lost.

Radical groups have threatened that the University of Wisconsin would not be allowed to open for the upcoming 1970-71 academic year.

A representative of the Wisconsin Students Association, at a press conference on Tuesday, the day of the threat at the computer center of the university and the day after the bombing of the Math Research Center, said that he felt the violence would not end at Wisconsin, or on other campuses around the country, because of the death of Fassnacht.

"People are getting used to the killing," he said, "ever since the killings at Kent [state college in Ohio].. Nobody raised a fuss at the shooting of the student at Kansas. This won't stop anything."

When asked why campus and government computer centers at universities were being attacked, he answered, "man, that's the heart of the Establishment. If they [the authorities] have to keep on buying all that expensive equipment, they won't have the bread [money] to buy bombs."

The Math Research Center at the University of Wisconsin has been the target of disfavor as the antiwar sentiment grew on the campus. It ranks high on the list of favorite places to picket, such as the Army-Navy ROTC building.

Math research officials said they did not like to express publicly what the work of the center was. They referred to a 1960 statement of Dr. Hans Buecker, a center staff member, who said: "The center provides consultation in mathematical problems for the Army. Its chief function is to seek solutions to mathematical problems confronting the Army which have never been solved before."

A handbill, one of many which appeared suddenly after the bombing, and one that carried a rather professionally done photograph of the damaged building, stated that "this was not any Mathematics Research Center solving any theoretical problems, but the nation's only Army Math Research Center whose role is to solve military problems, to design triggers for others to pull."

The handbill was signed, "Life Among the Trees." Its opening text read: "We who understand and support the demolition of the Army Math Research Ceenter . . . ." The bill went on to say that the center had been bombed because it was "force in return" for the center which, the bill claimed, had developed instruments for the "delivery of nuclear and chemical-biological bombs."

On the day after the bombing of the math center, a programmer on the Univac 1108 at the university's computer center which serves the math center, answered a phone call. "Get out of the building," the caller said, "there's a bomb about to go off."

The building was evacuated, and the police searched but no bomb was found. Police officials didn't say whether they thought the call was a hoax or part of a terror campaign, but they were taking no chances. Security for the university was tightened, not only at the bomb scene, but also at the ROTC building and the university's computer center.

A spokesman for Gov. Warren Knowles' office in Madison said that the governor had requested a tightening of security for all state-supported campuses in the state.

Arctic Becoming Cooler

COPENHAGEN – A Danish scientist said computer-aided analyses of a core of ice drilled from the Greenland icecap indicate Greenland is in a period of constant cooling.

Prof. W. Dansgaard of the University of Copenhagen based his prediction on measurements of oxygen isotopes in the ice core. He had the core cut into 7,000 pieces and measured the quantities of heavy oxygen in each piece.

The presence of this isotope is determined by the temperatures prevailing at the time of the ice formation. Measurement data furnished a picture of climatic cycles, including the glacial period.

No More Duplications

PHILADELPHIA, Pa. – Plans to introduce the first nationwide computer bridal registry have been announced by Scientific Resources Corp.

The registry will work through a centralized computerized system that establishes a "party line" through participating department stores, fine jewelry shops, and other retail outlets.

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David Appointed Science Adviser to Nixon

By Phyllis Huggins
Of the CW Staff

WASHINGTON, D.C. – An event quite significant to the computer community has occurred with the appointment of Dr. E.E. David Jr. as science adviser to the President and as head of the White House Office of Science and Technology.

David, 45, Bell Labs executive director of communications systems research, will take the post vacated by Dr. Lee A. DuBridge who resigned.

DuBridge said he planned to retire before he reached 70. The reaction of the scientific community to the new appointment, still to be confirmed by Congress, is best summed up by Dr. Sidney Fernbach, head of the Computation Department, Lawrence Radiation Labs. "It caught me by surprise. We've lacked in the higher echelons of government anyone familiar with our end of science. Now we have the President's ear. It is difficult to realize so soon what its effect on our science as a whole will be."

Keith Uncapher, speaking for Afips, said: "To have someone in that office who knows the impact of this technology on government and industry, not just the dollars spent, is tremendous. David grew up with our technology. In my judgment, the appointment comes at a very appropriate time because government reliance on computer technology is at a stage now where it is a major tool, as it is in many industries.

"I am very pleased with the appointment hut there are reasons for it. The job carries with it tremendous responsibility for every aspect of technology that is important to the government. It is a demanding job that is close to technology – and that is David.

"The pressures in such a post are enormous. Underneath all of that it is important to acknowledge that David can apply the skills acquired over the years to this new responsibility."

Budget Cuts

Since the budgetary cuts in government funding of research have been continuing for the past few years, the question is how much David, or anyone, can do with limited money.

Prof. Ed McCluskey Jr., president of the IEEE Computer Group, was restrained in his comments on the appointment. He said: "David is a very competent engineer and scientist. The fact that he has some involvement in computers and can understand what we are doing is good. However, I am dismayed by the parochial warfare that goes on on disciplinary grounds. I'm happy to have him in that office because he is a good man. Not just because he is one of us. I think that's the wrong emphasis."

Not so restrained was ACM, which could barely conceal its joy. David has been a luminary within ACM circles for some time.

Gordon Smith, executive director of ACM, sent the following letter to President Nixon:

"Your appointment of E.E. David Jr., as science adviser to your office is a brilliant choice. Dr. David has one of the finest, most refreshing and brilliant minds in the scientific world today. You could not have made a better selection."

It was noted in recent columns [CW, March 4] that this community was a "community without leaders," that even though this is the "computer age," in all prime government scientific commitiees at the federal and state level; computer scientists were conspicuously absent.

Reasons given by government officials for this included such comments as, "we can't have every discipline represented," and "computers are supportive."

Dr. E.E. David Jr.

Computerized Sewers

Monitoring System May 'Save' Lake Erie

CW Midwest Bureau

CLEVELAND – The general consensus of opinion in ecological circles is that Lake Erie, the second smallest of the North American Great Lakes, is dead and that the cities on her shores contributed to her death. One of those cities, Cleveland, has decided to do something about it, and a computerized system is going to make it possible.

The city's clean water, taskforce plans to install and operate a sewerage monitoring and control system to reduce the pollution of the Cuyahoga River and Lake Erie. Presently the Cleveland sanitation system could have raw sewage flow directly into the river and into the lake.

Reduce Overflows

The system, to be installed in the southerly waste water treatment area first, or approximately one-third of the city, will reduce overflows which now permit raw sewage to flow into the lake or into the river and then into the lake.

Sensors are to be installed in the city's sewer system that will report to a downtown computer center in a new utilities building under construction in Cleveland. The sensors will report, on-line, rainfall amounts, pump stations operations reports, and water waste levels in the sewer system.

Also, the sensors, with totally automated chemistry, will analyze the contents of the sewage flow. The input will be reflected by the output, the computer operation of control devices within the sewers that will contain overflow and operate the pump system.

The automated chemistry will analyze the water waste and feed constant input to the computers to allow them to channel the waste flow for maximum treatment according to standards requirements set up by the clean water task force.

The planned sensing system is said to be capable of preventing overflow of raw sewage and the hypassing of raw sewage from treatment with the resultant clean water flow into the river and lake.

The $2.5 million system is scheduled for completion within three years. The clean water taskforce project director, Kenneth Pew, expects the sensing-monitoring system to be expanded to the city's total water waste system once the first phase is operating efficiently.

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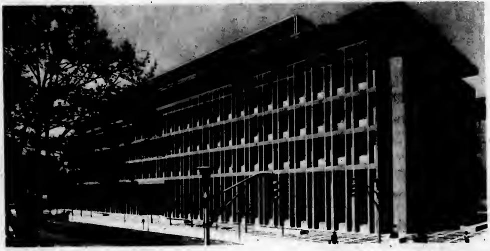

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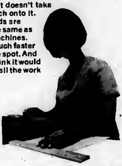
ASK them at London Life, one of Canada's leading insurance companies, how they like KEY-EDIT. They'll tell you that before they gave the Incredible Reducing Machine a trial, their operation was using roughly 23 million key punch cards a year. Next year, KEY-EDIT could reduce that number substantially. This remarkable data preparation system was installed in early April of this year. Ordinary transactions, Automatic Bank Check changes, health claims checks, and other checks that were previously coded on punched cards are now transcribed directly onto tape by KEY-EDIT, and then fed into the big computer in Computer Operations. The reaction to this sixteen keyboard installation has been most favorable for a number of reasons:

Bill Thomson, Information Systems Executive, has this to say about the KEY-EDIT system: "A mistake, either made by the key-stroker or even on the original card, will be found and corrected the same day. With this time-saving factor, ultimately this will speed up our service to policy owners."



Mrs. Linda Brown says: "I think I'll enjoy working on the system. There's less work involved for everyone and it doesn't take long to catch onto it. The keyboards are pretty much the same as the keypunch machines. But these are so much faster —they're right on the spot. And they're noiseless. I think it would be a good idea to have all the work done like this."

Larry Fazakas, Data Input & Control says: "Every year, we've had a tremendous increase in our workload resulting in more overtime for our keypunchers. We've also had a continual rapid growth in the keypunch area. We hope that with KEY-EDIT we'll slow down this growth rate and reduce the overtime work."

Nancy Foster shows the reel of computer tape that will replace the 32,000 punched cards she is sitting on. KEY-EDIT reduces floor space and costs to a minimum.

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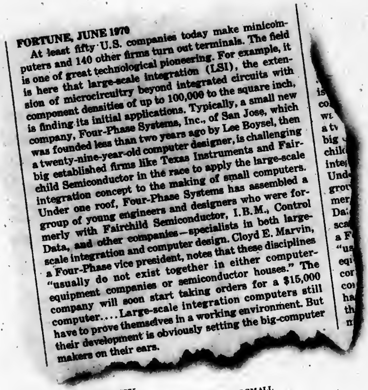

FORTUNE, JUNE 1970

At least fifty U.S. companies today make minicomputers and 140 other firms turn out terminals. The field is one of great technological pioneering. For example, it is here that large-scale integration (LSI), the extension of microcircuitry beyond integrated circuits with component densities of up to 100,000 to the square inch, is finding its initial applications. Typically, a small new company, Four-Phase Systems, Inc., of San Jose, which was founded less than two years ago by Lee Boysel, then a twenty-nine-year-old computer designer, is challenging big established firms like Texas Instruments and Fairchild Semiconductor in the race to apply the large-scale integration concept to the making of small computers. Under one roof, Four-Phase Systems has assembled a group of young engineers and designers who were formerly with Fairchild Semiconductor, I.B.M., Control Data, and other companies—specialists in both large-scale integration and computer design. Cloyd E. Marvin, a Four-Phase vice president, notes that these disciplines "usually do not exist together in either computer-equipment companies or semiconductor houses." The company will soon start taking orders for a $15,000 computer.... Large-scale integration computers still have to prove themselves in a working environment. But their development is obviously setting the big-computer makers on their ears.

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Editorials

Voice at the Top

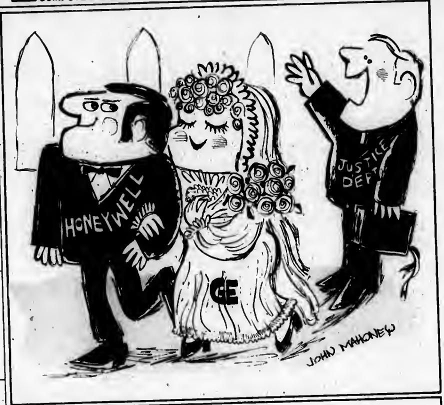
The appointment of Dr. E.E. David Jr. as science adviser to the President means that the computer community, probably for the first time, will have a knowledgeable spokesman in a key national position.

David, of course, was chosen because of his outstanding background as a scientist, not just because he was an expert on computers. And we certainly aren't suggesting that he will – or should – favor computers at the expense of some other science.

But a great portion of the outside world still looks upon computing and data processing as some sort of Black Arts. This awe leads people to expect too much of computers – and then to blame them, instead of the real cause, when something goes wrong.

Hopefully, David, with a carefully chosen word now and then, will be able to keep expectations within the limits of capabilities.

Computer science doesn't need a champion – but it certainly does need a friend in court.



D.C. Data-Line

Fed to Share Software?

By Alan Drattell
CW Washington Bureau

WASHINGTON, D.C. – The word around the nation's capital these days is "money" – and the Federal Government, like companies in the private sector, is trying to conserve on spending.

Typical of the government's periodic penchant for cost cutting is the frenetic groping for ways to accomplish this goal. And data processing has not escaped the economy-minded eye of many.

For one thing, like other users, the Fed has allowed costs in EDP to skyrocket. Although officially agencies are supposed to share equipment, software, facilities and personnel, only a little of this has been and is being done.

In addition, as pointed out in a recent blue-ribbon panel's report on operation of the Dapartment of Defense, often equipment that could satisfactorily perform only one application was purchased or leased. Adapting the machinery to do other work would be too expensive.

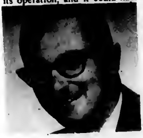
Whose Interests?

As private users have learned, too, the Fed has been oversold by overzealous computer salesmen interested in the buck and not in what the user really needed.

A recent conference in Myrtle Beach, S.C., on the management of computer systems in the Federal Government attempted to look at some ways to cut costs. One solution suggested was a plan which could have wide ramifications for the software industry.

In effect, the government sees itself as a single purchaser, although most procurements are made by individual federal agencies. The U.S. says it can save the taxpayers a lot of money, however, if each package is used on a sharing basis by agencies that need it.

For example, the Department of Agriculture might buy an accounting package. It would then, the thesis goes, offer the package to other agencies that have the same computer system and accounting setup. Thus, the Department of Transportation might find the package useful to its operation, and it could have it without reimbursing the original software seller.



Alan Drattell

Some Opposition

Naturally, the programming houses are not in favor of the concept. They feel it would be unfair since they do not view the government as a single buyer. Each agency, they claim, is similar to a large, single private purchaser.

A compromise approach in current use could be extended. A package is sold to one agency and then offered to other agencies within the federal establishment at discount prices.

One software house, for example, currently has a discount schedule on its programs to private users. The plan shows usage at two locations resulting in a 20% discount to both users; at three locations it escalates to 30% for all three; and so on.

Undoubtedly, there will be a great deal of discussion in the months ahead on software sharing. Programming houses that do a great deal of business with the Fed could he seriously hurt by the U.S. plan to save money.

Letters to the Editor

Dvorak Keyboard Allows 30%-50% Increase in Speed

Sometime back in the late 1930s, a Dr. August Dvorak performed a very thorough analysis of the standard typewriter keyboard arrangement, and found it to be very inefficient.

Dvorak went on to design a keyboard with the strategy of placing the most frequently used keys, such as the vowels, which comprise 40% of all strokes typed, on the finger rest row and under stronger fingers, and providing very efficient hand alternation.

If consecutive strokes are typed by opposite hands, one hand plays for position while the other is typing.

The result was a keyboard that allows a 30%-50% increase in speed, with fewer mistakes, and which can be learned faster. My 12-year-old daughter learned to type nearly 40 word/min in less than six weeks, practicing one hour per day.

The Selectric typewriter ball is making it possible for the Dvorak keyboard to become widespread as a typing instrument.

Our company would like to joint venture an investigation into the application of this keyboard in the computer key-data input industry. Could you publish this letter to see whether anyone is interested?

Bob McCauley
President

Motivational Communications Corp.
St. Paul, Minn.

What One Company Is Selling Is Not What the Other Wants

Your paper has recently focused much attention on the used computer market.

In one article you indicated through quotations from various sources the enormous discrepancy between prices for comparable equipment from several organizations. One indicated the point of view of a leasing company and the other indicated the point of view of a time broker.

Our industry suffers from the problem of credibility, capability and credit of those within it. The problem of "phoney prices and phantom machines" has plagued many sellers and huyers of computer equipment. Recently we have also suffered through several bankruptcies and liquidations within this industry.

The auction at the Parke-Bernet Gallery indicated that it was not the method for disposing of equipment, specifically using the auction approach.

Our company has had several hundred transactions, in computer equipment alone, since starting business. Over 80 of our customers have been responsible for repeat business on one or more occasions.

The problem with the used computer industry is that what one company is selling is not what any other company is wanting to buy. IBM has designed a proliferation of computer systems, devices, controls and components.

Our company has been successful in satisfying the complete needs of most sellers and the major needs of most buyers. What appears to be simple is complex through the multiplicity of transactions that must exist in moving one seller's piece of equipment.

It is hoped that this industry will develop into businesses which are established in terms of continuity, rather than having hundreds of one-man operations. The requirements of buyers and sellers cannot be handled through one-man companies, because of the complexity of services required to satisfy the needs of customers. The needs are to treat fairly the requirements of both buyers and sellers in terms of price, availability and supply.

I am writing this letter to put more light on this particular subject in that it appears that much smoke exists, along with confusion. Our company desires that this industry develop into one of responsibility, high ethics and credibility.

George S. McLaughlin, Jr.

George S. McLaughlin Associates, Inc.
Summit, N.J.

Information Sought on Computer Built in '40s by Dr. Atanasoff

We have a query from one of our members regarding an early research computer built during the early 40s by a Dr. John V. Atanasoff, professor of physics at the then Iowa State College.

It is said to have contained over 300 vacuum tubes, of which 45 were used in the memory unit. Some funds for its construction were from the Department of Agriculture.

If any reader knows anything about it, we would appreciate the information.

Enoch Haga
Executive Director

Society of Data Education
Livermore, Calif.

Honeywell-GE--a Real Need Exists for User Action

The Taylor Report

By Alan Taylor

Lots of people have been talking about the impact of the Honeywell-GE merger from an industry point of view – bringing out the strengths of the new company in the 1960s computer areas such as batch processing; and in the 1970s areas such as data management – noting how these strengths complement each other, and therefore augur well for the shareholders of the new computer giant.

This is all very interesting, but there are other interests that are of more immediate concern to most of us than the corporate fortunes of two giant multidivision firms. In particular, thy question lies open as to how the users are going to fare under the new situation.

Users in Danger?

To put it bluntly, mergers in computer firms do not have a very good history of quickly delivering to the users the advantages that could be reasonably expected from the pooling of talents involved.

Even now, the mergers that formed Univac and Burroughs over a decade ago still affect user offerings. Honeywell's own merger with 3Cs, despite the geographical proximity of the two computer headquarters (which are only 10 miles apart), has its share of continued isolation of expertise.

And in England where the much merged firm of International Computers Ltd. has established a really solid marketing base the internal troubles continue to take up resources that could otherwise be used to assist users.

Many of the reasons why users' prospects may be endangered by the merger are present in any merger. Mergers are not always good things – as both Penn Central and its passengers have found out. But in addition to these ever-present dangers computers are perhaps more vulnerable to merger woes than most firms. This is because a computer is not finished with when it is delivered. In fact, from the user's point of view, it has not yet started to be useful. It still needs software – and new software – and excellent maintenance – and all sorts of tender loving care that costs money if it is to keep its users happy.

This means that a high degree of management understanding and control is needed if the users are to receive the best use of their systems. And, as Penn Central also apparently found out, merger-management can find itself in real difficulties when faced with two stubborn, fighting sets of computer experts.

Yet dangers do not mean defeat. Nothing in the information that I have been able to gather in visits to Wellesley and Phoenix makes me want to predict awful things for the future of the users of the joint firm's equipment.

I do not see all GE users being stranded, or Series 200 users being left in batch processing, and unable to reach data management sophistication. Indeed, far from such ideas I do see a major potential advantage in the merger from both points of view. For the curious, key, fact is that in many ways both the lines represent each other's future development!

For the GE 600 for example, the future lies not so much in sophistication but in easing the technical requirements of using the system, and the consequent broadening of the installations that can readily find the necessary talent. Honeywell has demonstrated simplification of intricacies and as a result broadening a market base many times.

Equally, for the Honeywell user the future lies in achieving the data management sophistication that allows real random applications to be handled economicalty, and allows data storage of masses of data to be device independent. This GE has already. For both sides, the future lies in smooth straightforward running of current styles of operation while adding new, novel applications that are becoming practical for the first time.

Here again, Honeywell has experience both of the successes and of the problems involved. Put together, the merger presents a great potential for the users. They have a great stake in its success.

But, as I say, there are dangers, and God, it is said, helps those who help themselves. In many ways it can be said that the likelihood of a quick success, from the users' point of view, is marginal, so the question comes up as to what the users can do to help the merger be a real success. That is to say, there is a real need for user action at this point to ensure that users get the best possible chance of maximum profit from the emergence of what is clearly the first undoubted No. 2 in the computer industry that we have had since IBM beat Univac back into the also-rans.

Alan Taylor, consultant, writer, and former editor of *Computerworld*, is president of Computer Management Aids Corp. of Framingham, Mass.

User Group Meetings

The column suggests that users can play a valuable role in ensuring the success of the GE–Honeywell merger. Naturally, before they can play such a role they have to get themselves organized, and the user groups are the obvious places. There are meetings of the Honeywell User's Group and GE-600 group scheduled very soon – Honeywell in New Orleans Sept. 22-24; and GE's in Cincinnati Sept. 23-25.

Shouldn't you attend? In your own selfish interests?

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Letters to the Editor

Cobol Programmers' Guidelines Might Reduce Inefficiencies

If we read Taylor's article of July 8 correctly, all he seems to be saying is that due to certain implementations of Cobol compilers, a careless or unsuspecting problem-oriented programmer would likely cause large inefficiences in running time due to the order or choice of source program statements. (Regardless of how they are measured.) Furthermore, he seems to suggest that this is the rule rather than the exception.

I doubt if this is news to any seasoned programmer. Also, while possibly ignoring it, it is likely that most data processing managers are also aware that this situation exists.

As long as we're addressing an old problem, how about an old but simple solution. We would suggest that each Cobol installation develop at least one implementation-oriented Cobol support programmer who could audit the source statements in long-running programs and change the "few statements" where appropriate, to reduce this nasty overhead.

Where certain patterns develop, we would further suggest that guidelines or standards be written and circulated to all Cobol programmers in order to reduce future inefficiencies.

An alternative to this method would be to develop all programmers to be implementation-oriented. This would likely have the effect of reducing the advantages of Cobol as an easy to learn problem-oriented language.

These remarks, as stated above, are addressed to Cobol overhead. Overhead caused by faulty systems and file design are likely to be more serious and require more thoughtful, but similar, solutions.

Newell Usher
President

Newell E. Usher Assoc., Inc.
Chicago Heights, Ill.

Redefine of Date Field Needed

Alan Taylor, in his article "Do You Know What Your Cobol's Overhead Cost Is?", [CW, June 3] has fallen into the trap that lies waiting for the BAL practitioner who has some knowledge of Cobol, but not enough to differentiate between the inherent shortcomings of the Cobol language and just plain downright careless poor programming on the part of the undiscerning programmer.

Every so-called time consuming Cobol "fault" that Taylor points up is a result of lack of understanding on the part of the programmer vis-a-vis Cobol.

The date field problem presented is easily revolved by a REDEFINE of the date field as an elementary item and referencing the field by its redefined data-name.

As for the decimal point "business," any programmer worth his Cobol salt would see to it that all related numeric fields are set up with same PICTURE in the DATA DIVISION.

If Taylor were to reference IBM's DOS/TOS Cobol Programmer's Guide he would find quite an extensive coverage of how to employ Cobol's little nifties to avoid the time-consuming pitfalls that he imagines exist as an unbeatable roadblock.

Robert Kahn
Information Systems Designer

New York, N.Y.

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On Firmer Intellectual Bases for Computer Science

By D.L. Szekely
Special to Computerworld

I cannot get rid of the feeling that certain phrases like "computer revolution," "information explosion," and "artificial intelligences" are used far more often than deserved.

There is some justification in speaking of "revolution" and "explosion" – but the great danger involved in using such terms is that we are apt to lose any feeling for the scale of the processes referred to.

The fundamental fact remains that a revolution has many beneficial effects as it reaches into the depth of the problems it intends to solve.

In other words, we can characterize the computer revolution as a really deep-reaching revolution if it can develop a closed set of fundamental technical and axiomatic-level innovations.

A Warning

Nobody will try to deny that many fundamental innovations developed during the emergence of the computer and its first three generations – but still, the best characterization of the situation has been given by the warning of the chief scientist of IBM, Dr. E.R. Piore, in a speech at the ACM conference in 1969:

"We need very badly a scientific base for the computer industry . . . . We wilt get into a lot of trouble . . . . We will not make much progress unless we have much firmer intellectual bases . . . . " [*Datamation*, October 1969].

> We have trouble programming computers because we are now as advanced in the techniques of thought-processing as the old Egyptians were in the art of writing, argues D.L. Szekely. Just as the 3,500 pictographic components of hieroglyphic writing were later reduced to 30 characters on a phonetic base, a firmer base must be established for thought-processing, he asserts.
>
> Szekely, an engineer and chairman of the Association for Unification and Automation in Science, Jerusalem, Israel, believes that there exists a common foundation for computer science and functional brain theory.

We have to evaluate the situation – including the non-existence of the "much firmer intellectual bases" – against a background of the general history of science and technology.

Regarded from such a point of view, we are today at the very beginning, the very early stage of a revolution on which will augment our thinking potential.

I'll try to illustrate the measure of this augmentation by two parallels.

The first is the invention of the alphabetic principle and technique of writing in the age of hieroglyphic writing. About 3,500 pictographic components and their clumsy and fuzzy interplay were replaced by about 30, characters on a phonetic base.

The second is the computer itself as an aid to arithmetical calculation, augmenting its speed and accuracy by well-known factors.

Now, I maintain, the real "information explosion" will augment our concept-applying and thought-processing potential, by similar degrees of efficiency. But the condition for this is first to have "firmer intellectual bases." What could be the more explicit meaning of this indication?

A firm intellectual basis must be given by an axiomatic level approach to thought-processing and its two instruments: languages and processor-systems of codes and languages.

We are now as far advanced in the logic and technique of thought-processing as the old Egyptians were in the art of writing by their second generation of hieroglyphic writing. This is why we have so many difficulties with the programming of computers for more scientific problems: the problems of a disunified prescience have no alphabetic units or functional modules for scientific thinking.

This is why we cannot program the dominant concepts of humanities. This is why we have no context-based programming languages. This is why we are suffering from growing diversification. This is why we are doing, unadmittedly, the same thing, the same research over and over again, just clad in slightly different and equally incompetent verbalistic concepts. This is why we have no axiomatically justified psychology and sociology or a more encompassing form of computer science.

Physical Logic

The point is this: the processor of thought and concept-patterns is the system called "brain." The brain is an instrument of survival in a physical environment, therefore the logic of the brain is a physical logic, a logic applied to and modified by the physical environment.

Viewpoint

Moreover, the brain functions by generating and storing patterns (or concepts) exclusively from fired-not fired replies of physically specialized neurons. The machine code of the brain is, therefore, a digital code, but with a strong emphasis on the physical specialization of the neuron. The brain reduces everything to physically qualified 1,0 replies and their patterns. By using such a digital code, the brain technically unifies, at machine-code level, the universe of its reactions to the physical environment!

In other words, "unified science" exisits actually and is embodied in our brain. What is missing is our explicit knowledge of the assembly system, the assembly code for the human brain: a code based on total and physical reduction.

Digital-Physical

The next problem is the bridging of the total gap between the digital-physical machine language of the human brain and the high-level programming languages, up to the colloquial language. This requires the design of a context-based and totally reducible language with physically qualified digits.

It is evident that when creating the necessary linguistic theories and tools, we must preserve the unifying faculties inherent in the machine language of the brain.

This is why the assembly code mentioned must have a focal position between the low-level language of the human brain and the many languages of higher level.

Moreover, this assembly code must have functional units easy for reduction but suitable for atomistic application in higher languages. A code designed with a view on the unifying assembly level and retaining the interdisciplinary unifying faculties of the human brain deserves the name "Unicode."

This is why we have to study the logic of interdisciplinary unification and the "firmer intellectual bases" exposed by its theory.

Axiomatic Level

To arrive at a computer science with firm axiomatic-level control and physical logic, we have to develop physical-relational bases for science wherever possible.

I am convinced that to arrive at a firmly based computer science we have to take the roundabout way and develop first the foundations of the brain system and its physical relational logic.

The brain system is far more general than the computer system. The fundamental theory of the computer can be developed as a specific chapter of the more general theory of the brain – especially of the optimized artificial brain system.

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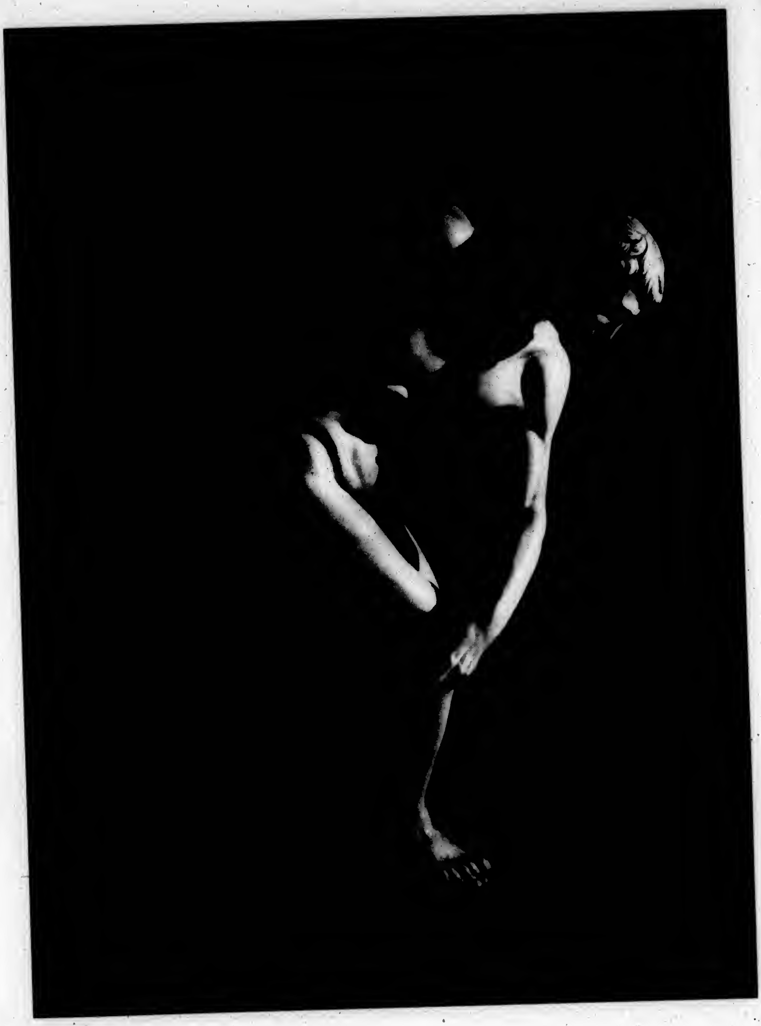

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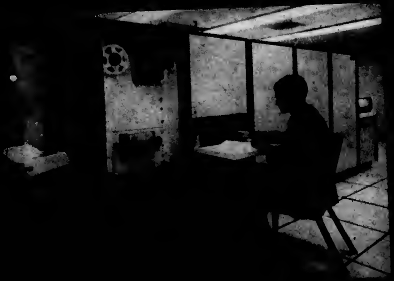

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Cross Assembler Uses Iterative Language Processing

By Don Leavitt

CW Staff Writer

TARZANA, Calif. – Users with access to various central processors can have assemblies for any one of them run on machines that support ASA Standard Fortran, with the Basic Iterative Assembly System (Bias), developed by Compata Inc.

According to Compata, Bias features an iterative approach to language processing and emphasizes user convenience, host machine independence and speed of assembly. It is expensive, however, in terms of core requirements.

An unintended benefit to the Bias user could be an assembler that is considerably richer than the one originally used on a particular machine. The Bias coding includes features for various assemblers and these could be allowed in any Bias package if the user asks for them.

This cross assembler is said to use one or more high-speed intermediate passes to relieve the user of restrictions common in more conventional assemblers.

Bias is written in ASA standard Fortran to provide machine independence. The company said that by limiting the coding to the standard Fortran, Bias could be used on a wide variety of machines and was not tied to any particular system, as it would be if it used the fully enhanced 360 Fortran.

In addition to using standard Fortran, the overall design of Bias is modularized to facilitate adaptation to a wide variety of target machines with minimum modification.

Speed of assembly is said to be achieved in part by the use of binary search techniques and data compression. Under Level G Fortran IV, the company said, speeds up to 350 card/min are typical when assembling code for a DEC PDP-11 on a 360/50, in a 100K byte partition.

Processor features include the automatic selection of short or long instruction formats, formation and placement of address literals, and freedom to use forward references in all argument expressions.

Other features include conditional assembly, logical and arithmetic expression operators, and program sectioning. External references, cross-reference lists of symbols and error lines, and continuation cards are also available under Bias.

A Compata spokesman noted that although Bias is not primarily intended as an enhancement to other assemblers, features beyond those incorporated in the original assembler for a particular machine could be included in the Bias cross-assembler version.

The company said that work has been completed on Bias for the DEC PDP-11, and that that processor is operational. Work on other assemblers is at varying stages of development. Deliveries should average six weeks for new machines, Compata said, and less time for those machines for which the adaptation is complete or in progress.

Bias is available either at a small one-time charge for end users or on a special royalty basis for computer manufacturers wishing to make the cross-assembler available to their users.

Cost of the Bias version for the PDP-11 is $1,000. Costs of other versions would probably be somewhat more than that, the company said, since they would reflect additional development costs.

Compata Inc. is at 18345 Ventura Blvd.

IMS/360 Users Get Reporting Language

READING, Mass. – Managers of large-scale 360 installations operating under the IBM-provided Information Management System (IMS/360), can use Query Language/1 (QL/1) to interact with their data bases in direct, simple, English-language statements.

According to the developer, General Analytics Corp., QL/1 is the first inquiry and reporting language designed for use with IMS/360. It gives the system flexibility that has been missing up to now, the company said.

IMS/360 is a data management system offered by IBM to users of its larger computers, generally from 360/50 upward. It effectively stores and controls the varying data base structures commonly used in large-scale on-line environments, but it cannot create, modify or access the data base except through specially written programs, in Cobol, BAL or PL/1, according to the firm.

General Analytics said that QL/1 offers two features that are not available in the IMS/360 language: a conversational query capability, and a report generator that produces reports quickly and in virtually any format.

In the query mode, QL/1 provides on-line access to a data bank, enabling the addition, deletion or modification of information in the bank, the listing of selected information and the performance of statistical calculations. The developer claimed that in all of these areas, the system can use an unlimited number of modifiers so that any action taken can be as restricted or encompassing as needed.

In the report made, the user is said to be able to create and store reports with nearly unlimited control of formatting and content. QL/1 specifies the report when given simple English-like statements, and executes it for any set of specific conditions.

Operating in report mode, QL/1 provides margin and tab settings, pagination and dating, three levels of heading and one footing, and variable spacing and paragraph indentation. A company source added that justification and centering of text is also possible with QL/1.

Also provided in report mode are internal logic control constructs, full relational and logical operators in comparison statements, and nesting of subreports to any level. Textual and numeric constants can be included anywhere in a report. QL/1 also has full editing capabilities, including spelling, ordinalization and cardinalization.

Thesaurus

General Analytics said that QL/1 accesses the data base through a Thesaurus, or cataloging scheme, in which a full set of descriptives of each data element is maintained. These include the length in bytes and type of data, and whether the element is indexed or is a key. Every data element also includes its hierarchical relationship to other elements in the data base, including all information pertinent to an IMS Data Base Description.

As a result, when accessing data, QL/1 can accept an English-like data element name and generate a full Data Language/One CALL, using all of the relationships inherent to DL/1, without requiring the user to be aware of their existence.

QL/1 operates on any 360 that supports IMS/360. The query mode operates in a teleprocessing environment as an IMS Type 1 program. Report mode and utility functions operate as IMS Type II programs. In an IMS environment where teleprocessing is not supported, the company said that the entire QL/1 system can be executed in a Type III region under OS/MVT or MFT-II. In a batch-processing report-generation system, 262K bytes of storage are required.

QL/1's purchase price is $25,000. A straight lease plan and a lease/purchase plan are also available on minimum six-month contracts ranging upwards from $750/mo. The developer will provide training, language documentation and maintenance. Installation is said to require about one day.

The release date for QL/1 is Oct. 1, the company said.

General Analytics is at 100 Main St.

Microfilm Directory

SILVER SPRING, Md. – The National Microfilm Association (NMA) has announced plans to publish a directory of microfilm systems service companies.

The proposed directory will list organizations offering professional microfilming services to the public on a commercial basis, according to an NMA spokesman.

NMA is at 8728 Colesville Road, Suite 1101.

Market Service Pinpoints Sales Potential by States

NEW YORK – Marketing directors, sales managers and corporate planners of industrial manufacturing companies can use a three-part market information service available from Economic Information Systems (EIS).

According to EIS, this service pinpoints product sales potential in any state, at a cost of $500 per state.

The information provided is intended to show the user which industries in the selected state buy a product, where the buyers are concentrated, and the name and address of each buying plant. In all three categories, it is said to qualify the prospect by employment size class and estimated amount of the product consumed.

Census Bureau

EIS said that the information built into its data base is primarily taken from the industrial studies conducted annually by the U.S. Census Bureau. Beyond that, the company said it includes other data from trade associations, state and industrial directories, clipping services, and its own plant survey.

The company claimed that the data is accurate enough to help a user pinpoint potential customers in any market area wanted, by region, state, county, or even Zip Code. It can determine a company's share-of-market for any product, and, in general, supply all the marketing components needed for decision making on increasing or decreasing distribution channels.

The EIS service provides the information through three printouts. Printout 1 is a summary of sales potential in the selected state, describing, by four-digit Standard Industrial Classification, the chief industry consumers of the specified product, the number of plants they have, and an estimate of how much of the product each industry buys.

Printout 2 describes the distribution of the potential customers in the state. County by county, it lists the prospect plants, qualifies them by employment size class, and estimates how much of the specified product each buys, by plant.

Names, Addresses

Printout 3 lists, in each county, the names and addresses of up to 1,000 of the chief prospect plants for the product. It identifies the principal business of the plant and, again, estimates by plant how much of the product each consumes.

EIS said that its service can be used to develop information for less-than-state wide areas, but that the $500 charge would still apply. Multistate or national reports would vary in price, the company said, depending on specific product and area requirements.

The company added that most of the full national reports it has supplied thus far have ranged in cost from $5,000 to $8,000. Some, however, have cost as much as $18,000, a spokesman admitted.

If a user gets a state report and then comes back later for a national or multistate report that includes the original state, EIS said that it will credit the user with the $500 paid for the first report, towards the cost of the larger project.

EIS said that the printouts will be completed and returned to the user within three weeks of receipt of an order.

Economic Information Systems Inc. is at 21 West 38th St.

Complex Systems I/O Supervisor Package Monitors Multiple Interrupts for PDP-8/I

NEW YORK – Installations with DEC PDP-8/I mainframes can use a general-purpose I/O Supervisor package from Complex Systems Inc., which is said to monitor multiple interrupts in a real-time telecommunications system as well as control local I/O devices in a non-real-time environment.

Interrupt handling by the Supervisor is performed in an enabled state to allow the concurrent fielding and servicing of multiple interrupts. The company explained that the I/O requests are serviced from queues made by the system applications programs. The Supervisor initiates processing for all I/O by successively performing all the queued requests.

The Supervisor is said to have the capability of servicing simultaneous input and output on a teletypewriter console. It can also handle DEC TC-01 tapes and DF-32 disks, as well as programmable real-time clocks, 680-I telecommunications clocks and the power low option.

Highly modular in design, the Supervisor is made up of logical subsystems for each of the peripheral devices supported. New functions can be added, the company said, with minimal effect on the rest of the system.

According to the firm, the Supervisor requires from two to four thousand 12-bit words of storage, depending upon which peripherals are included.

The purchase price of the Supervisor is $4,000, exclusive of any modifications or additional peripheral support.

Complex Systems Inc. is at 122 East 42nd St.

FCC Notified That US Satellite Systems Are Planned by Communications Firms

CW Washington Bureau

WASHINGTON, D.C. – At least four companies have told the Federal Communications Commission that they contemplate filing in the future for a domestic satellite system. The systems would probably have the capability to handle the communications of computer data users.

Data Transmission Co. (Datran), and American Telephone & Telegraph Co. repsonded to an FCC request of Aug. 7 that all organizations expecting to make domestic satellite applications notify the commission of their intent by Aug. 19.

Other organizations, including the three major broadcasting networks, were expected to submit letters to the FCC, and a spokesman for the agency said a list of the companies would be available soon.

Western Union Telegraph Co. became the first firm to file for such a system when it submitted an application to the FCC late last month.

Significantly, Microwave Communications of America, Inc., which is planning a national data system, said it was not intending to submit a letter at this time but this did not preclude the possiblity of filing for a domestic satellite system at a later date.

Datran's letter was submitted on behalf of a consortium to be composed of itself and/or one or more other subsidiaries of University Computing Co., and one or more independent firms "to be identified at a subsequent date." The satellite proposal will be ready for filing by Dec. 1.

Teleprompter, a cable TV firm, said it would file by Oct. 15 probably in participation with Hughes Aircraft Co.

AT&T reportedly intends to file by Oct. 15; Comsat within two months.

Milgo Modem Handles 4,800 Bit/Sec Data

MIAMI – International Communications Corp. (ICC), subsidiary of Milgo Electronic Corp., has introduced its first adaptively equalized 4,800 bit/sec modem.

Called the Modem 4500/48, it is particularly suited to those applications where line characteristics change widely or frequently, such as those installations where different lines are used interchangeably with the same modem, the company said. The new unit is also designed for use in those applications where unattended operation is necessary.

Equalizes and Tracks

The Modem 4500/48 was specifically designed for users requiring dedicated full duplex service and calls for Bell Type 3002, C-2 lines. The data set automatically equalizes and then adaptively tracks any changes in the amplitude or delay distortion characteristics of the line.

Even if telephone line routing changes drastically, the data set will bring itself into an optimum condition for the new line characteristics, according to ICC. The adaptive equalization feature is completely self-synchronizing and requires no special programming.

ICC Modem 4500/48

The unit is currently available at a price of $7,500 in small quantities.

International Communications Corp. is at 7620 N.W. 36th Ave.

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Tel-Tech Cuts Data Set Prices

ROCKVILLE, Md. – Tel-Tech Corp. credits increased production efficiencies and lower IC component costs with making possible reduced prices for its entire line of data sets.

The price on Tel-Tech's 201B standalone 2,400 bit/sec Bell-compatible data set has been reduced to $1,495 in small quantities. The OEM version of the 201B has been reduced to $1,345 in small quantities. The 201B was formerly priced at $1,800.

Communications

The OEM versions consist of two low-profile printed circuit boards, configured to the customer's particular size and shape requirements, Tel-Tech said.

Prices have been reduced proportionately on all other Tel-Tech data sets, the company said. Prices of the Tel-Tech data multiplexers, however, were not included in the reduction.

Tel-Tech Corp. is at 11810 Parklawn Drive.

Idiiom System Adds Color Display Unit

MOUNT KISCO, N.Y. – Information Displays, Inc. has added a color capability to its Idiiom computer-controlled graphic display system.

The color Idiiom is designed to offer greater differentiation and detail in such applications as computer-aided design, process control, and simulation for research and testing, the company said.

The colors – red, green, yellow-green, orange, and red-orange – are provided by a single-gun penetron-type CRT, according to the company.

The new unit incorporates the basic features of the standard Idiiom, including light pen, blink and character-rotate controls, and an expandable memory.

The basic price of the color unit is $69,500, or 10% more than the black and white unit. It is available on a four-month delivery schedule.

Keypunch Replacements—Part II

Machines Handle Computer Compatible Tape Formats

By H. Edward White

Special to Computerworld

The basic concept of the keypunch replacements is to offer more productivity per dollar expended for keypunch labor, supplies, and equipment rental. The various manufacturers have taken four different approaches to the problem.

The "key to tape" systems are by far the most popular. Ten manufacturers, including Mohawk Dete Sciences, who announced the first keypunch replacement in 1965, will be discussed here. The other nine include Burroughs (manufactured by Data Trends), Friden, Honeywell, International Data Sciences, Keymatic Data Systems, Management Assistance (manufactured by Digital Information Devices), Potter Instrument, Sangamo, and Vanguard. Typewriter systems are excluded from this series, because keypunches are not normally equipped with typewriters.

During the pest two yeers over 30 compenies have developed keyboerd-type data recording devices designed to replace keypunch equipment. Apparently these compenies believe that meny of the estimated 400,000 keypunch end verify devices installed in this country will be repleced by their equipment.

But how valueble are these new devices to the kaypunch user? Are thay cost effective? Do they increase efficiency?

In this series CW explores the adventages and disadvantages of the keypunch replacement devices.

All of the machines offer tape code systems which cover the input requirements of all major computers, 7 or 9 track, or even parity. If you choose to work in Ascii, Vanguard has it.

There are other features common to all:

- Data is recorded into a buffer. Error correction within a record (the equivalent of a punched card) can be accomplished by backspacing, for one or more characters, or for the complete record (most offer field backspace, also). This feature is probably the biggest time-saving and accuracy improving element of keypunch replacements.

- Need more than 80 columns in a record? All offer additional buffer capacity as an option. Sangamo can give you up to 240 characters.

- All units have verification on the same machine, as standard equipment. The previously written records are read into a buffer, verified (just like on a keypunch verifier), corrected on the spot (if necessary), reverified (if corrected), and written onto tape. If you have much verifying to do, many dollars can be saved by correcting errors as they are detected instead of in a separate operation. Also, when the volume of keypunching isn't perfectly balanced with the volume of verifying, you can alternate the use of one machine between the two functions.

- Programming is like a keypunch, i.e. Program 1 and Program 2. Both programs are standard on the keypunch, but at least half of the replacements in this class make it an option (this includes both Honeywell and Mohawk).

- Left zero fill is also available as an option on ell the replacements.

There are differences between a keypunch and a key-to-tape replacement – and differences among the systems!

For example, a keypunch device is programmed by punching a drum card; It may be kept in a drawer or file, and easily inserted when needed. Replacements (in this class) are programmed by keying a similar program into e buffer, but there is no card to store the program for future use.

Since most keypunch replacements are used on high-volume applications, the operators usually load and verify the program manually each time. If you change programs more than once or twice a day, automatic program loading may be important to you. Take a good look at Burroughs, Potter, and Vanguard. Some of the others offer automatic progrem loading. Sadly, no system is as easy as wrapping a card around a drum!

All of the systems offer an illuminated column indicator. Some are simple "bit" lights (Mohawk), to a full two-digit displey with numbers one inch high (Potter).

All of the replacements talk about a display to show the last character entered, something which even the printing keypunch cannot offer. Mohawk and Potter offer BCD (7 track) or Ebcdic (9 track) bit lights, and Honeywell has an octal display which, when used, requires a hand motion to a switch above the keyboard. Do your operators know BDC, Ebcdic, or octal codes? (Honeywell gives the poor operator a decode chart!)

Mohawk and Honeywell were the first machines announced. Some of the others decided that a true character display was needed. MAI offers an actual character display in a single character location – very simple to read and locate. Another popular display is a facsimile of the keyboard located behind the work area. A light displays the actual character in the column position indicated in the column display.

90% of Replacements

Over 90% of the keypunch replacements in use are Mohawk or Honeywell – yet they have done the least with easy-to-read displays. Does this mean that a true character display is relatively unimportant?

If you are going to train experienced operators, remember, they have been punching a long time without a display. It would undoubtedly help them when correcting errors, but if it is difficult to read, they'll get along without it – just like the old, familiar keypunch. New operators are bound to appreciate a true character display. It can reduce their learning time, and make their work more accurate – sooner.

Surprisingly, none of the displays shows the last character entered. The column indicator (always showing the column to be entered) is kept "in step" with the display, forcing the operator to backspace and rekey just to check an entry. The "true character" manufacturers followed the lead of the bit display systems instead of making their better display a "quick reference" for the operator.

How to Handle Tape

Your operators will have to learn to handle tape. Most users say this is not much of a problem: If you want to avoid it, take a look at MAI's cartridge loading which completely eliminates operator tape handling.

MAI has another exclusive feature: an "overfilled field" warning light – especially useful in preparing name and address files when long names require abbreviations to prevent errors.

Want a CRT so that the operator can see the whole record before writing onto tape? These can be useful to eliminate key verification where 100% accuracy is not required (e.g. name and address files). MAI scores again (optional at extra cost).

Would more reading board space for the operator be helpful – with slightly less floor space than a keypunch? Sangamo has it.

When selecting your vendor, be certain that local service is available. It can be very important when unavoidable downtime occurs. If you are away from a major metropolitan area, Friden's large number of service locations may be to your advantage.

Will the computer read the tape faster than punched cards? The answer is obviously, "yes," but not as fast as you might think! Remember, each record (usually only 80 characters) is a block of data. A 30K char, 800 bit/in. tape drive will read about 3.3 times as fast as an 800 card/min reader. If your input computer program is "printer bound," you'll save nothing!

Data Communications

Where have users found these machines to pay off the most? Probably in data communications. Most offer telephone line interfaces. You can record data at a remote point, transmit at 1,200 bit/sec rates, and receive data on computer-compatible tape at machine prices much below other systems.

Any disadvantages? When several keypunch operators work on an application, it is easy to stack their punched cards in the computer card reader. Unfortunately, tape drives don't come with hoppers, so we must either load each tape individually (very slow), or "pool" the several tapes onto a single tape on a "pooling" device.

All of the manufacturers will hook two machines together for you (for a price); one will read the several tapes, and one will write the data onto a single tape for loading onto the computer.

Friden can help overcome the pooling disadvantage. It can wire several units together, making pooling simultaneous with data recording. This also saves hardware dollars, but if the tape drive requires service, the operators are all out of work!

Several other companies take the same approach as Friden, and they will be discussed in a separate article. Friden offers a combination of "standalone" capability coupled with a "wire together" approach.

The need for pooling raised a question. "If we must pool, can we save money by recording on non-computer compatible tape, and "pooling" onto computer tape?"

And a whole new group of machines was born! These will be discussed next week!

H. Edward White has been an independent data processing consultant for the past seven years. He has had extensive experience with data recording and communications equipment, and is currently manager for corporate planning at I/O Com Inc.

PDP-8 Users Get 3 Disk Memory Units Allowing Storage Sizes up to 4,194K

PALO ALTO, Calif. – Three head-per-track disk storage systems from Data Disc, a supplier of independent peripherals for minis, offer the PDP-8 user storage capacities ranging from 32K to 4,194K 13-bit words.

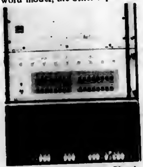
Described by the manufacturer as offering a choice of reliable, available memories, the Data Disc systems include the 1732 and 1708, similar in many respects to DEC's DF32/DS32 and RFO8/RS08 disk systems. The third system is the 1714, which has no counterpart in the current DEC disk line.

The 1714 system consists of from one to four disks each with a capacity of 1,049 words. Seven increments of storage are available from 65K to 2,097K, with an average access time of 16.6 msec. The data transfer rate is 125K word/sec.

The use of a single-cycle data break is said by Data Disc to result in shorter computer servicing time. The single-cycle break requires only one memory cycle to enter a word into or retrieve it from memory. Three memory cycles are required by most PDP-8s to transfer data to or from a disk file.

Said to be plug- and program-compatible with the DEC PDP-8, the 1714 can make use of link address programming, according to Data Disc.

Prices start at $10,200, including installation, for the 65K word model, the other capacities are priced at $11,200 to $59,700, including controller.



One of Three Data Disc Plug-in Memories for PDP-8s.

Data Disc's 1732 Disc Memory System is said to be identical in capacity and performance with DEC's DF32/DS32 system. It is available in capacities of 32K, 65K, 98K, and 131K words. Unlike the DEC device, the 1732 achieves increased capacity by making more data tracks on the disk available, instead of adding additional drive units.

Average access time for the 1732 is 16.6 msec with a data transfer rate of 30K word/sec.

Prices for the four 1732 storage capacities are $6,500 to $11,400, with controller.

An exact replacement for the DEC RF08/RS08 disk file, the 1708 features a transfer rate of 60K word/sec, twice as fast as the 1732, with an average access time of 16.6 msec.

Using one of two disks and drives, the capacities attainable are 262K to 1,049K words.

Price tags on the 1708 system, including controller, are $14,800 to $36,800 for the four storage capacities available.

Prices for the 1708, as well as for the 1714 and 1732 systems, include installation and software. According to Data Disc, substantial quantity discounts are available on all systems.

Both the 1708 and 1732, as opposed to the 1714, use the three-cycle data break.

Purchase prices include a warranty of 90 days on labor and two years on parts. Service contracts are available.

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Compat File System Provides Random Access Via Tape Loops

WESTBURY, N.Y. – Described as a new and revolutionary random access memory system, the Comfile is said to provide the data access and organization styles of disks and drums at the low-cost associated with magnetic tape cartridge systems.

Compat Corp. said that the new system is composed of the proprietary Comfile Data Storage System, a Comfile plug-in interface, and a Comfile utility program.

The complete Comfile Memory System is housed in a free-standing pedestal unit accommodating one or two tape drives, control-electronics, and a library of up to 12 tape loop magazines.

Comfile Data Storage

At the heart of the Comfile Memory System is the proprietary Comfile Data Storage System containing a 30 in.-long magnetic tape loop capable of providing any mini- to medium-sized computer with up to 72,000 characters of data storage. Stored data is accessible within an average of 350 msec. Worst case access is 900 msec.

Data is recorded on the loop at a density of 3,000 bit/in. and is recorded serially by bit on one track at a time, as contrasted with conventional parallel recording in which a single character is written across all nine tracks. Serial recording not only greatly increases data storage density, but also eliminates the problems of tape skew and tape distortion, Compat said.

The Comfile magnetic tape loop is completely enclosed in a magazine which is inserted into the Comfile drive. Any Comfile magazine can be read on any Comfile drive allowing flexibility in interchanging magazines among computers. A file-protect mechanism – similar to a write ring in a reeltype tape drive – guards against inadvertent recording.

The entire Comfile magazine and drive combination has only three moving parts. The tape head and tape cleaners are the only parts touching the oxide side of the tape, the company said.

Price of a complete Comfile Data Storage System is $1,200. Additional magazines are priced at $35 each. Delivery is 60 days.

A typical Comfile Memory System with one Comfile drive, controller, interface, software, in a free-standing cabinet sells for $4,500. An additional Comfile drive costs $2,500. Delivery is 9 months.

Compat Corp. is at 177 Cantiaque Rock Road.

OCR Unit Reads Katakana, English

DALLAS – Users with EDP operations in Japan can read documents written in English and/or Katakana, the font derived from tha basic Japanese Kengii language, with the Electronic Retine Computing Reader from Recognition Equipment Inc. (REI).

Ketakena has been established as the EDP industry standard for Japan, and consists of 45 lower-case characters, plus two diacritic marks, which provide 25 additional characters when used with certain of the basic cheracters. Numerals in tha Katakana set are the commonly used Arabic numbers, according to the company.

REI said its reader can read many different typa faces on en intermixed basis and can read up to 360 individual characters as specified by the user.

REI said that it hes a demonstration program that takes advantage of the fect that Japanese words can be written with the Roman alphabet as weil as with tha Ketakena charecters.

Information typed or printed in Katakana is read from documents and then recorded in three ways: on magnetic tape in machine-readabla form; on an I/O typewriter equipped with a special typing eiement that uses Katakana characters similar to the source document; and on e high-speed lina printer as a Roman alphabet phonetic "translation."

A user who understands tha spoken language, but cannot read the Ketakana charecters, can read this line-printed information as though ha were reading the Katekana charactars, the company said.

Recognition Equipment Inc. is et 1500 Mockingbird Lane.

Disk Drive From Talcott Designed for 360/20 Use

SAN LEANDRO, Calif. – A disk drive designed for users of IBM 360/20 and other comparable computer systems has been introduced by the Friden Division of The Singer Co. and The Talcott Computer Leasing Division of James Talcott, Inc.

The new Talcott 9311/11 disk drive will provide savings, based on average lease lengths, of up to 50% over comparable units used with smaller computer systems, according to Talcott. The 9311/11 offers plug-to-plug compatability, and can be intermixed or interchanged with the 2311 Model 11 or similar disk units.

Friden and Talcott officials stated that the 9311/11 can be used 24 hours a day without extra use charges. Utilization of extra shifts are said to enable users to effect savings of more than 50%, they added.

For a one year lease, the monthly rate is $400; for two years, $375; for three years, $335. Rates include maintenance by Friden's nationwide service organization. Talcott Computer Leasing provides the lease plans for the 9311/11.

The 9311/11 is available through local Friden branch offices.

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EUROPE TODAY

Issue 16. A ménage à trois in Europe for CDC, ICL and CII -- after months of saying we're only good friends, ICL (UK) and CII (France) admit to a serious flirtation but CII, with typical French coquetry, is also holding hands with CDC. EDP Europa Report examines the affair and the same issue takes a brief look at the Danish market.

Order your copy of EDP Europa Report Issue 16 now, at the non-subscriber price of $5, £1.75 (£1. 15s) USA, $3.35, £1.40 (£1. 8s) Europe, and have its full value accredited to an annual subscription for 24 issues $65, £27 if taken up within two months. Orders may be placed at either of the following offices.

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Houston FJCC to Feature 310 Exhibitors, Over $200 Million in Latest Equipment

HOUSTON – Well over $200 million worth of the latest innovations in computer hardware, software and services will go on display here Nov. 17-19.

The exhibit, an integral part of the 1970 Fall Joint Computer Conference (FJCC), will include approximately 310 exhibitors who will occupy 1,000 booths in the Astrohall. Sponsored by Afips, the conference is expected to draw approximately 40,000 persons to its exhibits and technical program sessions.

According to Robert A. Sibley Jr., conference general chairman, the exhibit is a complete "sell-out." Included will be over 100 organizations that will be displaying their products and services for the first time in a Joint Computer Conference.

The exhibits, Sibley added, will cover approximately 300,000 sq ft of the exhibit hall and will feature a wide variety of equipment and services.

The size and diversity of the exhibit and conference reflect the dramatic growth of the computer field and the increased application of EDP systems to almost all areas of industry, business, commerce, and the professions.

Societies

The conference exhibits and technical sessions are open to all interested persons. Registration is $20 for members of the 12 Afips constituent societies, $40 for non-members, and $5 for students and enlisted military personnel in uniform.

Further information, including registration and housing forms, are available from the 1970 FJCC Printing and Mailing Committee, P.O. Box 58036, Houston, Texas 77058.

DPMA Awards Research Grants

PARK RIDGE, Ill. – Victor Powers and Janet R. Smith have been awarded the 1970 research grants of the Data Processing Management Association (DPMA).

A number of such grants are made annually by DPMA to selected doctoral candidates preparing dissertations in the field of data processing and computer management.

The awards of $2,000 each provide that DPMA is entitled to receive a copy of the completed doctoral manuscripts and give the association first option to publish them.

The title of Powers' dissertation is "The Present Impact and Future Implications of the Single Information Flow Concept on Accounting for Management Reports."

Mrs. Smith's dissertation is on "Accounting Information for Management Control: A Model for a Data Acquisition Policy."

DPSA to Hold Input/Output Systems Seminar

STAMFORD, Conn. – "Input/Output Systems Seminar 70," sponsored by the Data Processing Supplies Association (DPSA), will be held at the Barbizon-Plaza Hotel in New York City, Oct. 26-28. The program for the seminar will be composed of presentations by peripherals manufacturers with strong emphasis on new applications and new equipment.

OCR/OMR systems will be extensively covered, with topics including presentations on Allied Computer System's ReaDoc; Cognitronics' Rock System/70; CDC's OCR hardware; Cummins-Chicago's Scanak 216; Data Recognition's DRC-700 reader/encoder; and Farrington's document readers, page readers, and journal tape readers.

Key-input system presentations will include: Consolidated Computer Services International's Key-Edit, Honeywell's Keytape and Vanguard Data System's Key-to-Tape.

EDP printers featured are Data Products' 4300 series high-speed line printers, IBM's new 2,000 line/min train 3211 printer, and NCR's 640 series high-speed line printers.

For further information contact the Data Processing Supplies Association, 1116 Summer St., Stamford, Conn. 06905.

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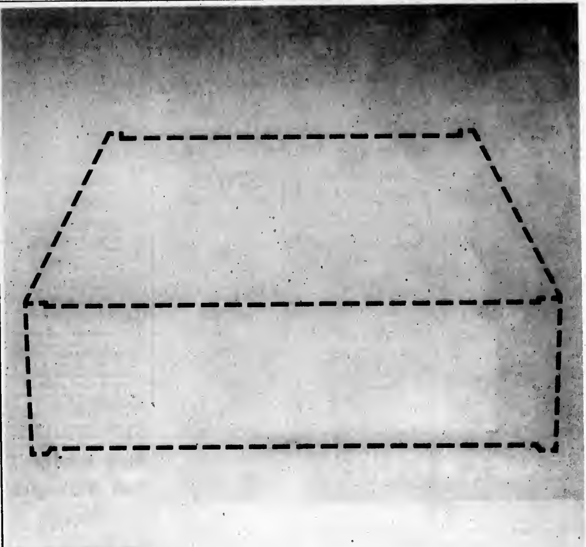

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Annual National Meeting Of Asis to Begin Oct. 11

PHILADELPHIA – The 33rd Annual National Meeting of the American Society for Information Science (Asis) will be held Oct. 11-15 at the Sheraton Hotel here.

The meeting will center on "The Information Conscious Society" and is expected to be attended by more than 1,500 information science specialists and users of information systems.

"The conference," stated Dr. Eugene Garfield, general chairman, "will emphasize the need to meet current unsatisfied requirements for information by various segments of our society.

"While glowing forecasts have been made of the ability of information specialists to deliver information to users, we plan to center our attention on the proper satisfaction of the appetites for information services which have already been stimulated."

Tutorial Sessions

In addition, special tutorial sessions will be held at the Sheraton Hotel before and after the conference. The preconference tutorials, on Sunday, Oct. 11, will review the state of the art for the non-specialist in information science. Two general sessions will be held during the morning; the first will be devoted to highlights of the punched-card period in documentation (1945-1960).

The second will cover a demonstration of information analysis. These general sessions will be followed by parallel morning and afternoon sessions consisting of in-depth, sophisticated introductions to various special areas in information science.

The preconference tutorial sessions will conclude with personality roundtables which will provide an opportunity for participants to meet and talk informally with some of the best known individuals in the information science field. The post-conference tutorial will be held on Oct. 16 and 17 and will include three sessions directed towards the librarian who is looking for a short introduction on the automation of library facilities.

In addition to the conference technical program, exhibits, and the special tutorial sessions, an extensive program of technical tours has been set up.

Registration for the conference is $45 for Asis members and $60 for non-members. One-day registration is also available at $15 for members and $20 for the public. Students may register for the entire conference for $3. Fifteen dollars of the non-member full conference registration fee may be applied towards 1971 membership in Asis, providing application for membership is filed with the Society by Dec. 15, 1970.

Preregistration

Preregistration prior to Sept. 21 is required for attendance at the preconference tutorials. There is no additional charge for full conference registrants. Those registering for the conference on a one day basis may also register for the preconference tutorial at $5 for Asis members and $10 for non-members. Registration fee for the post-conference tutorial is $45 for Asis members and $55 for non-members. Registration for this tutorial includes two luncheons and full reference materials.

Further information on the conference may be obtained from Miss Sheryl Wormley, Asis, 1140 Connecticut Ave., N.W., Suite 804, Washington, D.C. 20036.

Misra Receives Alexander Prize From Washington ACM Chapter

WASHINGTON, D.C. – The Washington Chapter of the Association for Computing Machinery recently announced that Jayadev Misra, a PhD. candidate in Computer Science at Johns Hopkins University, received the $1,000 Samuel N. Alexander Memorial Award for 1970-1971.

In presenting the award, Dr. Herbert Maisel of Georgetown University, chairman of the awards committee, cited Misra's academic record at the Indian Institute of Technology and Johns Hopkins University and his future potential. The committee was especially impressed with the scope and importance of his research interest and stated that the successful completion of his research activities could substantially improve programming technique.

In a summary of his research, Misra said the research is divided into two parts: the problem of identifying "good" and "bad" programs – in terms of ease of understanding, debugging, and modifying – and trying to define complexity for certain logical processes – how much complexity is involved in inverting a matrix, searching a table, etc.

FJCC to Discuss Government Stand

HOUSTON – "The Effect of Government Controls on the Computer Industry" will be the subject of a panel discussion at the 1970 Fall Joint Computer Conference.

Rep. Jack B. Brooks, Beaumont, Texas, has accepted an invitation to discuss the government's position. He has played a leading role in the formulation of legislation which affects the computer field in Congress.

Additionally, Dr. Herbert R.J. Grosch of the National Bureau of Standards will discuss the setting of standards for the government which may affect the industry.

Representing the computing equipment industry on the panel will be individuals from IBM, Univac and CDC.

Members of various computer usage groups will also discuss government controls from their points of view.

Adapso Offers Unique Directory

NEW YORK – The combined 1970-71 Computer Services Buyer's Guide and Adapso Membership Directory to be issued in late September 1970 will be the first directory of its kind to be published in the computer services field.

Adapso and Technology Publishing Corp., publishers of the Association's *Computer Services Journal*, will offer in the directory information on several major categories: computers, peripherals, supplies, computer and data processing services and software applications.

In addition, a listing of the nearly 600 data centers represented in Adapso membership will be posted.

Single copies are priced at $10, and may be purchased from Technology Publishing Corp., 647 North Supulveda Boulevard, Bel Air, Los Angeles, Calif. 90049 or Adapso, 551 Fifth Ave., New York, N.Y. 10017.

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TDCC Publishes Congress Affairs

WASHINGTON, D.C. – The Transportation Data Coordinating Committee (TDCC) has published the proceedings of the Standard Point Location Code Congress held recently here. The publication provides information on geographic coding systems used by some shippers, carriers and government agencies.

Copies of the proceedings can be purchased by writing the Transportation Data Coordinating Committee, 1101-17th Street N.W., Washington, D.C. 20036.

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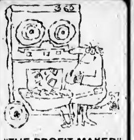

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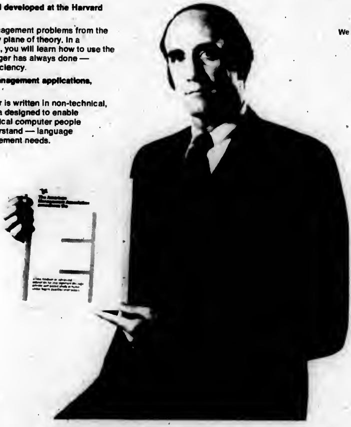

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Attendees, Exhibitors Taking a Gamble at Wescon

By Drake Lundell

CW Computer Industry Editor

LOS ANGELES – The horses weren't running, the tote boards were blank, and there were no lines in front of the $100 windows, but a lot of big gamblers showed up at Hollywood Park and the Sports Arena here last week for the Western Electronics Show and Convention (Wescon).

And the show itself was taking a gamble – pushing the computer products section like never before in hopes of bigger crowds and more exhibits than might normally have been drawn from this presently economically depressed section of the country.

Besides the show, there were large gamblers among the exhibitors and the attendees.

One Big Fling

Several of the exhibitors were throwing their entire advertising – and in some cases marketing – budgets into one big fling at Wescon. If successful, they would keep going; if not, several Chapter 11 bankruptcy proceedings may be in the works.

Some of the attendees were also gambling – engineers gambling on jobs that are in short supply out here at the present. Wescon even allowed what it euphemistically called "unattached" engineers to attend without paying the normal $3 admission fee. Unfortunately, the "at liberty" engineers had to register in special areas and some seemed to prefer paying rather than identifying themselves as out of work.

Some of the gambles will pay off, more of them will not. It is too early to tell, but the immediate reaction of the computer exhibitors can be gauged and it does not particularly augur well for the Wescon experiment.

It appears that Wescon attendance will be down by somewhere around 20% when compared with the record-breaking show held in Los Angeles in 1968, when most firms were more worried about the SEC regulations on new registrations than on the IRS bankruptcy proceeding.

The 1968 show – Wescon was held in San Francisco in 1969 as it is every other year – had an attendance of 48,000 and it also had around 10% more exhibitors than the 550 here.

Wescon sold 90 booths to computer-related exhibitors, up over the 42 booths in 1968. In addition, the show featured seven special sessions related to computer industry topics.

Not Coming Back

But many of the computer-related exhibits may not be back for another go-round when Wescon opens next year.

The primary reason expressed by the large exhibitors for coming to Wescon was that it was the only show to be held on the West Coast this year that would attract the type of audience they wanted to reach.

The Fall Joint, which is the traditional West Coast show for these firms, will be held in Houston this year, and most of the large exhibitors felt that they needed some West Coast exposure.

Digital Equipment Corp. (DEC) said that it was at the show to help in overcoming its image as an East Coast firm. "A lot of our business is out here," one DEC source said, "but no one seems to know who we are or that we are the largest minicomputer manufacturer in business."

(Continued on Page 34)

The computer exhibits at Wescon drew medium-sized crowds as exhibitors and attendees gambled on the future.

Honeywell Begins HDC-601 Production; Airborne Unit Is Series 16-Compatible

By Frank Piasta

CW Staff Writer

ST. PETERSBURG, Fla. – Engineering-model production of Honeywell's newest general-purpose aerospace computer – featuring complete compstibility with the company's H-316 and DDP-516 computers – has begun here.

According to Honeywell, the plated-wire 16-bit HDC-601 is compatible in programming, software, and I/O interface with the Series 16 computers. Delivery of the first engineering model was made in July by the company's Aerospace Division – Florida.

Weighing only 30 lb, the HDC-601 is designed specifically for installation aboard aircraft. The design represents a refinement of the 516 for a different market.

According to Honeywell, the development costs of the new machine were 40% to 50% less, largely because of the savings in software development.

The company termed the 601 the only aerospace general-purpose avionics processor to offer:

- Complete compatibility with a series of accepted commercial computers.
- Plated-wire, non-destructive read-out (NDRO) memory.
- A fast (1 μsec) memory cycle time with low (122 W) power requirements.

Initial spplications include delivery to the Honeywell Systems and Research Center in Minneapolis for use in Air Force reconnaissance and target locator program, and with the Florida division's advanced development program of a Gimbaled Electrostatic Aircraft Navigation System (Geans) for the Air Force.

'Offers Software Savings'

"The HDC-601, with its Series 16 compatibility, offers aerospace computer users an opportunity for substantial savings in software time and cost," Clinton M. Crabtree, division director of computer products, said. "With it customers can begin programming without waiting for hardware delivery."

Crabtree pointed out that this approach has allowed division guidance specialists to begin software work on the Geans system using a DDP-516 prior to delivery of the first HDC-601.

Crabtree said all Series 16 software is available and usable on the 601. The software package includes real-time On-Line Executive, DAP assembly, Fortran IV compiler, subroutine library, utility and test programs and diagnostics.

The HDC-610 was developed to meet a variety of manned aircraft applications, including navigation, fire control, reconnaissance and electronic counter measures. It is the newest of Honeywell's family of five aerospace computers.

Memory

The 601's plated-wire memory features an add time of 2 μsec. Its memory of 8K words is expandable to 32K in modules of 8K words. The NDRO 5-mil diameter plated-wire memory has a .5 μsec access time with a memory protect and parity checking available.

Processor and I/O logic construction uses TTL medium-scale integrated circuits on modular plug-in boards that are easily accessible, Honeywell said, for removal or replacement.

The 601 has a 9 μsec multiply time and a divide time of 19 μsec. It offers memory options of the NDRO Honeywell plated-wire or standard military core. All current production contracts are for plated-wire memories, Honeywell said.

With an 8,000 word memory, the 601 weighs 30 lb in a 19.6 in. by 8.3 in. by 7.6 in. configuration.

The unit uses parallel organization, 16-bit word length and fixed-point single address.

The HDC-601 meets the following Mil Specs, according to Honeywell: MIL-STD-801B; MIL-E–5272C; MIL-E–5400K; MIL-STD-461, 462; MIL-STD-704; and MIL-E-8189B.

European Analysis

Merger Picture Clears Up . . . a Little

By Malcolm Butler

CW European Bureau

LONDON – The betting in Europe is no longer on whether the European computer companies get together to form an effective challenge to the U.S. companies, but when and how they will associate.

Speculation in the business press has given way to more informed comment since the recent admission by the UK's largest computer manufacturer, International Computers Limited (ICL) and France's product of its "Plan Calcul," Compagnie Internationale pour l'Informatique (CII), that they have in fact been having serious discussions on more direct cooperation.

Previously there had been the takeover of the large computer activities of AEG Telefunken by Siemens with the encouragement of the West German Government. This, although it was denied, meant a virtual bowing out of the computer market by AEG Telefunken because its main computer activity is in specialist larger systems area.

It is true, however, that AEG Telefunken is not known outside West Germany while Siemens is more well known.

Mostly, Siemens machines are the products of "plastic badge engineering" – RCA Spectra machines with Siemens' name on them. Apart from CII, ICL and Siemens, there are only two other European computer firms which can be considered in the context of mergers and cooperation, Philips and Olivetti.

It is believed that, apart from casual associations, Olivetti will not seriously consider any overtures made to it by other companies. This is felt because Olivetti did not have a particularly happy association with GE in the days when it was making computers. Today, Olivetti concentrates on its terminals and relies on its past expertise in computer manufacture in the design and sales of its terminal systems.

Philips, or to give the DP operation its correct name,. NV Philips Electrologica, possibly has more equipment installed or on order than is currently realized.

Somewhere in the region of 4,000 of its P350 visible record computers have been sold with machines in the company's larger P1,000 series doing very well also. About 30 of the P1100 machines have been installed and several of the P1200 and P1400 systems are installed or ready to be delivered.

The company entered the computer field in 1968 although it had already done about six years of research by then. It has since formed a peripherals division which manufactures magnetic tape units, disk drives and paper tape readers. As a new entrant into the commercial systems market Philips can be said to have been fairly successful.

There are signs now, though, that Philips is getting just a little jumpy at the prospect of the other European companies getting together.

Then, too, the whole issue gets even more confused with the arrival on the scene of Control Data Corp. Both CII with one of its parent companies Thompson-CSF, and ICL have some contact with CDC. The French are to exchange research and technology in disk drives, OCR equipment and advanced computing techniques. ICL is negotiating an ambitious agreement covering common research, development and marketing.

So what now – will the end of the year see a large-scale collaboration between ICL, CII and Philips and perhaps even CDC? It is an open question and one that will only be answered by the passage of time.

Which Firm Will Survive?

Beware the 'New Marketplace'

By Paul C. Lisle

Special to Computerworld

"What does a customer want?" "What will make him buy my product?" These are questions that everyone in marketing should be asking themselves before setting out to sell mainframes, peripherals, or software during the economic turmoil of the '70s.

The computer industry has been plagued with nonexistent hardware, unavailable software, late deliveries and shoddy maintenance.

Considering the severe financial troubles that have recently engulfed hundreds of small computer-oriented companies, the computer industry of the '70s could well follow in the footsteps of the auto industry of half a century ago, and end up with three companies performing all of the domestic production.

Keen Competition

With some 80 minicomputer manufacturers and almost that many CRT terminal manufacturers – just to mention two areas of the industry – competition is keen. And the deciding factor in determining which company will survive will be the answer to the basic questions of marketing: "What does a customer want?" "What will make him buy my product?"

In the past, much computer equipment, including software and peripherals, has been presented in the marketplace with the premise that when the orders roll in, consideration will be given to production, delivery, maintenance, and, in some cases, final design.

This approach has been successful in the past, and, unfortunately, too easy. By performing a minimum of R & D, blanketing the media with news releases, and purchasing advertising from the trade publications, a company has been able to amass thousands of sales leads.

These leads were hotly followed up by high commission and often high-pressure salesmen and representatives, many of whom closed a substantial number of sales with blue sky and promises that were totally unrealistic. This method worked because a large number of the customers did wait until production was geared to fill their orders and until maintenance arrangements could be made to handle their non-operative hardware and software.

Tighten His Belt

But this method will not work today. Due to the rigid economic conditions, the computer industry customer – the patient, understanding, and, for the most part, good-natured OEM and end user customer of the past – has had to tighten his belt along with everyone else. No longer can he afford long delays in delivery and extensive downtime due to inadequate maintenance. In addition, today's customer is smarter and more sophisticated in evaluating his computer requirements than ever before.

Today's salesman must know his field, have a product that is fully planned and constructed, and have technical back-up and readily available maintenance; he must be able to show his prospect how the equipment or services offered will meet the prospect's requirements or improve his efficiency or increase his profits, and in many instances all three criteria must be met before a sale can be closed.

In addition, the offered product had best perform as promised, be delivered promptly, and have maintenance to the customer's satisfaction or there will be no payment forthcoming and certainly no follow-on business.

The company offering the product must be able to lease or rent, in addition to outright sales; must offer maintenance either by contract or on call; and must be able to prove to his customer that he is financially stable so that the agreements, contracts, and promises of today will be honored tomorrow and in the years to come.

Time will tell if the only companies that can meet customer requirements and provide customer satisfaction in the '70s are the IBMs of the industry; or if the smaller companies will be able to rise to the challenges of the economy, evaluate themselves and their customers accurately, and develop the strong, solid business practices that have come to be the basics of the older industries.

Paul C. Lisle is the vice-president of the representative division with Computing Corp. International, Inc.

Navy to Get RCA Drum Memory

NEW YORK – RCA is developing three lightweight, high-capacity drum memory systems for the Navy's Message Processing and Distribution System (MPDS).

Two of the systems will be installed aboard the USS Nimitz and the third will be employed in development activities by the Naval Electronics Laboratory Center (Nelc). RCA's Electromagnetic and Aviation Systems Division, Van Nuys, Calif., is producing the drum memory systems under contract to Nelc.

The computerized MPDS automatically processes, records, and delivers messages received aboard ship.

The RCA drum memory systems will be employed for storing both message data and computer programs for the MPDS.

The heart of each memory system will be a drum that stores 9.6 million bits of data in 1 cubic ft of space. It will have a data transfer rate of 1.75 MHz and an average access time of 11.4 msec.

Key to the drum's ability to store large quantities of data in a small space results from a unique form of phase modulation. The technique reduces error rates while permitting packing densities in excess of 2,000 bit/in.

Special proprietary design techniques also reduce weight of the drum rotor to just two lb. Along with other construction features, this enables the drum to function in rugged environments associated with seagoing, airborne, and land-based military applications.

N.Y. City Education Department Handles Increased Workload With Key to Tape

CW Midwest Bureau

NEW YORK – The nation's largest school system has solved its input bottleneck problem that was compounded by a 1969 New York law.

The New York City Board of Education had its data entry problems multiplied when a 1969 law decentralized the huge system and created 31 systems in its place.

Previously, the board employed a card-oriented input system. In May 1970, the board switched to key-to-tape, a system planned and installed by the Data Action Co. of Minneapolis.

Designed by the board's bureau of management information and data processing, the new system, according to the bureau, has resulted in lower input costs and a reduction in data preparation time.

The bureau said a study undertaken after the Data Action equipment was installed has shown a high increase in productivity. "We have experienced," said Victor J. Facio, deputy for systems development, "a substantial productivity increase over keypunch in some of our applications."

The board installed three Data Action 150 magnetic data inscribers, key-to-tape cartridges, and a Data Action 500 tape pooler for transferring data from the cartridges to standard computer tape. The 150s are used in the board's EDP center to process purchase orders, payrolls, and attendance programs.

More Purchase Orders

Since the decentralization of New York City schools, there has been a marked increase in purchase orders sent to the bureau. More than 40,000 different orders for textbooks alone were forwarded to the bureau for the upcoming school year.

The orders are sorted, and the information is entered on tape. The accumulated data is used for supervision and control of the purchasing done by the city's schools.

The bureau stated that the orders for textbooks were converted to magnetic tape in only three weeks using the Data Action equipment. "Using tape cartridges," said Sarah Spataro, keypunch supervisor, "we can keep the work flow moving. With the cartridge, we can key and verify and complete the work in a relatively short time."

According to Joe Engels, assistant director of the bureau, the operators prefer using the inscribers because they are soundless, except for a small "beep" at key depression which assists the operator in developing a typing cadence. "One of our biggest problems," he said, "is that all girls want to be assigned to the machines."

Facio said that Data Action equipment was selected by the board for a number of reasons. "We don't need to spend a lot of time on training," he explained, "because of the similarity of this machine to the keypunch. We have a girl now who has only been on the machine two days and is already completely productive."

Payroll

The bureau also handles payroll for the school system. With more than 150,000 employees, a large number of different payroll systems are employed. Many of the employees are active in more than one area, and may receive multiple paychecks.

A new system for payroll is being implemented and many of the payroll systems are being phased into the new program. According to the bureau, the new Data Action equipment makes the processing faster by eliminating punch cards, card verification, and card to tape conversion.

For the attendance bureau, the bureau of management information and data processing maintains a reporting procedure on student transfers and discharges within the system. These reports are used to produce reports for calculation of state aid and school planning. The reports also provide statistical information on school dropouts.

Key-to-tape recording is done during the day, 8:45 a.m. to 4:45 p.m. Processing is done in two shifts on an IBM 360/30 and 50 located two floors above the input preparation section in the board building.

...From Baggage to Shipping Computers

NEWARK, N.J. – From railroad baggage pickups in 1860, to distribution of computers in 1970 – that is how a Newark firm has grown and changed in the past 110 years.

Founded as McGrath's Express and later (in 1907) incorporated as Roseville Storage, the firm last year changed its name to Data East Warehouse Corp. to reflect its modern specialty.

From a single horsedrawn wagon and a small office at 22 Cabinet St. in Newark's Roseville section, Data East has expanded to 17,500 sq ft of office, storage and shipping facilities in the Federal Warehouses complex at 320 Elizabeth Ave. in the city.

A 20,000 sq-ft headquarters building is now under construction in Raritan Center industrial park, at N.J. Turnpike Interchange 10 in Edison. The new building has been designed with a high ceiling which will enable Data East to store crated DP equipment on triple-decker steel racks, for an effective storage area of more than 40,000 sq ft. Space in Newark also will be retained.

"We need the additional space to cope with the growing demand for our DP equipment distribution services," explained John W. McGrath, secretary of Data East and great-grandson of the founder. His father, William J. McGrath, and his cousin, Rohert, are the firm's president and vice-president/treasurer, respectively.

Although Data East is the nation's first exclusive electronics agent for North America Van Lines, every carrier of electronics equipment is represented at its docks daily.

Due to the specialized service the firm provides, customers request their shipments be sent to Data East. Data East is the exclusive distributor of IBM systems in the metropolitan area, shipping the delicate computers to industries in nine states. Burroughs, NCR, Honeywell, Control Data, Bell & Howell, 3M, Transitel, and other major DP equipment and photo machine manufacturers also rely on Data East for warehousing and distribution to and from customers.

Study Predicts Phototypesetting To Rise 300% in Next Five Years

LOS ALTOS, Calif. – Phototypesetting is expected to mushroom 300% in the next five years to become a $150 million a year business by 1975, according to a new research study prepared by Creative Strategies, Inc. (CSI).

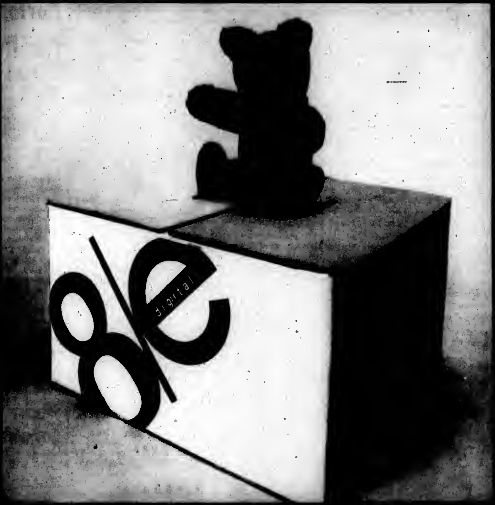
CSI, a high-technology research and consulting firm, reports in depth on four new segments in the phototypesetting market which, in the next five years, are expected to capture 65% of the market. The fastest growing segment, low-priced text oriented machines, should grow at a compound annual rate of 43%, the study predicts.

38% Growth Rate

The medium-priced ($100,000) electronic CRT devices can anticipate a compound annual growth rate of 38%. The extremely fast, high-priced CRT machines (over $300,000) are expected to reach market saturation and experience declining sales after 1973.

This is partly attributable to their high-speed capability – eight CRT machines, working a single shift, could typeset all the books published annually in the U.S.

The new PDP-8/e: Its own mother wouldn't know it.



The PDP-8/e is a radical departure in computer design. There's no back panel wiring — everything plugs into the OMNIBUS, even the CPU. In any order. It's completely flexible; you buy only what you need. And if you need more later, just buy it and plug it in. And the PDP-8/e is easier to interface and easier to maintain than old style computers.

We've made a few other changes. Easier programming. 1.2 µsec memory cycle time. 15 added instructions. 256 words of read-only memory. 256 words of read/write memory.

Yet there's no generation gap between the PDP-8/e and the rest of the PDP-8 family: computers in 7500 world-wide installations. They all use the same peripherals (over 60 of them). They're all program and interface compatible. They all have extensive application and documentation. PDP-8/e was [illegible] with [illegible] software packages [illegible].

The basic 4K machine sells for less than $5000. With teletype, less than $6500. Quantity discounts available.

digital

[illegible]
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New OEM Products

Phoenix Converters Enter Field

PHOENIX, Ariz. – Phoenix Data, Inc. has begun marketing a new line of analog-to-digital converters dubbed the A/D 500 series.

The Model 501050 is a 10-bit binary analog voltage to digital converter utilizing the technique of successive approximation to provide a resolution of 1 part in 1,023 with an overall measurement accuracy of ± 0.1% of full range, according to the firm.

The Model 500850 is an 8-bit binary unit with reduced resolution and accuracy, the firm added.

In single lots the 10-bit unit is priced at $285 and the 8-bit model is priced at $260. Delivery is two weeks.

The firm is at 3384 Osborn Road.

HEI Card Reader Array Debuts

CASKA, Minn. – HEI, Inc. employs thick film technology and phototransistors in its latest Card Reader Photo Array. The unit, available in three models, incorporates a glass cover to eliminate dust.

Each sensor in the unit is shielded to eliminate cross-talk, the firm said, and there are models with 12, 13, and 14 sensors available. The 12 photochips are mounted on 0.25 in centers with the 13th and 14th sensor locations optional.

Chips are aligned to within ± 0.003 in. in both the X and Y axis, the firm claims. The price for the units is $20 ea in lots of 100. They are available from stock.

The firm is in the Jonathan Industrial Center.

Veeder-Root Shows Counters

HARTFORD, Conn. – Veeder-Root has introduced the Mini-Flex counter that is said to combine low voltage electronic counting decades with a 6-figure electromechanical totalizer. The unit is said to be "ideal" for high-speed counting on printers and keypunches.

Standard models are available for 5 Vdc or 24 Vdc, and the counter and electronic decades can be reset to zero by a manual pushbutton or by a remote switch.

The Series 7124 uses integrated counting circuits and accepts signals from switch closure or pulse input. When pulse input is used, count speed is 400 count/sec for models with one electronic counting decade, or 4,000 count/sec with two electronic counting decades.

The device is designed for panel mounting and connections are made at the rear terminal strip. Options include various supply voltages and other mounting methods.

Price for the model with one decade is $150; the model with two electronic counting decades sells for $185.

Veeder-Root is at 70 Sargeant St.

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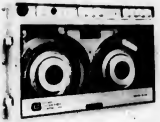


Genisco Model 850D Recorder

Genisco Recorder Portable, Suited For Rugged Use

COMPTON, Calif. – Designed for data gathering under severe environmental conditions, a magnetic tape recorder from Genisco Technology Corp. produces IBM-compatible tape.

The Model 850D Airborne/Portable Digital Magnetic Tape Recorder is meant for use in such on-site digital data gathering operations as seismological research. Said to be extremely well protected against dust, shock and vibration, the recorder can operate under temperatures ranging from 0°F to 140°F and very high humidity.

The Model 850D has a tape capacity of 1,250 ft on standard 8-1/2 in. IBM reels, which allows direct use of recorded tapes on computer transports. It operates at 7-1/2 in./sec with a recording density of 556 bit/in. or 800 bit/in. and a high speed search mode of 120 in./sec. Combined start and stop distances at 7-1/2 in./sec is 0.46 in., minimizing record gaps, according to the company. Heads are available in 7- or 9-track formats.

Priced at $12,000 to $15,000 in unit quantities, the Model 850D is available in OEM quantities at a reduced price. It is currently being shipped within 90 days.

Trio Laboratories Power Unit Converts Current for Minis

PLAINVIEW, N.Y. – A device that puts power in shape for use by computers is offered by Trio Laboratories, Inc. Called the Series 600 single and dual output 100-W minicomputer power supply, the product takes ordinary current out of the socket, regulates it, reduces voltages, and provides two or three outlets.

Series 600 meets the specifications for MIL-E-16400, Class 4 environment (shock/vibration/transient line surges). The power supplies can withstand an input line voltage of 30%/1 sec voltage transient, the company said.

The MIL-environment units are: Model SP-601-1002 for 5 Vdc/20 A; SP603-1009 for 10 Vdc/10 A; SP613-1003 for ±18 Vdc/3 A; SP614-1004 for ±25 Vdc/2.2 A; SP605-1005 for 25 Vdc/4.4 A. Dimensions are 3.25 in. by 6.50 in. by 7.50 in.

The units could be hooked up to a power source, a spokesman said.

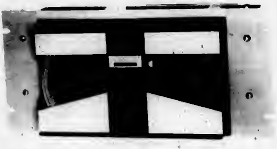
The price of Model SP-610-1002 ranges from $400 to $300. Delivery is immediate for small quantities.

Trio Laboratories, Inc. is at 80 Dupont St.

New Redcor Warranty Policy

CANOGA PARK, Calif. – A lifetime warranty policy covering Redcor Corp. conversion products has been announced, effective immediately, to include the 770 Series of modules, multiplexer/analog-to-digital converters, and the 990 IC tester.

The address of Redcor is P.O. Box 1031.



High performance miniature punched tape reader with fan-fold handler.

Miniature Tape Readers Available From Decitek

WORCESTER, Mass. – A miniature punched tape reader, operable up to 600 char/sec is available from Decitek, a division of Jamesbury Corp.

Tape is transported on a dual sprocket stepping motor drive. Reading error and tape wear resulting from edge guidance and keeper hardware are thereby eliminated, the firm claimed. Dual sprocket drive also avoids tape breakage from simultaneous energizing of pinch roller and mechanical brakes, which can result from power failure logic mix ups, Decitek said.

Test paper loops have run through the reader for 280,000 cycles with negligible wear. All power for starting, stopping, and running are developed and transmitted directly from the stepping motor.

Basic reader is on a 5 in. sq mounting plate. Complete reader assembly with electronics and power supply is on a 7 in. by 19 in. rack panel.

Light from a single source is transmitted to the read head through a nine-section fiber optics array. Each of the nine fiber optic elements is mounted directly opposite the elements of a nine-element photo-transistor array. The tape is precisely transported between the fiber optic tips and the photo-transistors.

Light through a hole in the tape causes the corresponding transistor to go into saturation. No mechanical adjustments or lubrication are needed or provided for and there are no lenses to go out of adjustment, Decitek declared. There is no detectable cross talk.

Interface circuitry is available for direct interface to many computer systms, according to the firm. Logic 0 is 0 V and Logic 1 is 5 V in both input and output electronics, and are directly compatible with DTL- and TTL-integrated circuits.

Base prices for the 300 char/sec model are $857 in unit quantities and $695 in lots of 100. The 600 char/sec unit sells for $904 for 1-9 and $733 in lots of 100. Models with fan-fold attachments are also available. The units are currently available two weeks ARO.

Varian Converter Designed for Use With 620/i Mini

PALO ALTO, Calif. – The Varian SpectroLogic S-1401 Analog-to-Digital Converter designed for use with the 620/i minicomputer, delivers a digital signal suitable for direct input.

An internal sample-and-hold module is said to permit precise determination of the time at which each sample is taken.

Conversions may be initiated upon receipt of a command from the computer, or automatically by allowing the converter to operate synchronously. The computer can select 8-bit or 13-bit resolution (including sign), resulting in conversion rates to 180 kHz for the lower resolution and to 102 kHz for the higher resolution.

High intensity front panel indicators, according to Varian, facilitate monitoring of converter activity by the user. The 13 indicators display the last value digitized by the converter in binary two's complement format.

Options include multiplexer for multiple inputs; a frequency counter for computer-selectable gate times; a crystal clock for enhancement of sample timing, and interrupt logic for higher throughput.

The converter is housed in a single tray of the standard SpectroLogic 19-in. rack mounting module, requiring 5-1/4 in. of vertical rack space. An additional tray may be added to contain other SpectroLogic modules, such as D/A converters or digital control functions.

The S-1401 is priced at $5,175 in quantities of 1-10. It is available 90 days ARO.

Varian, Graphics and Data Systems Division, is at 611 Hansen Way.

Impact Printer Has Own Power

KING OF PRUSSIA, Pa. – A new member of the 3064 series of portable digital impact printers, the Model 3064-E, from Dataline, Inc. contains its own power supply and other electronics.

The unit, which prints 30 char/sec, features large-size characters that are nearly 1/8 in. high, with 9 char/in. in the 64-character Ascii subset (full alphanumeric plus symbols).

Prices start at $575 in one to nine lots, and drop to $401 in quantities of 500.

The firm is at 181 South Boro Line Road.

Latest Collins OEM Disk File Stores up to 33.5 Million Bytes

DALLAS – Collins Radio Co. has added the Model 9200 A-1 disk file to its line of OEM products marketed by the data systems division.

The new 9200 A-1 is capable of storing 33.5 million 8-bit bytes per 8-disk file, the company said, and can be implemented with up to eight files per controller.

In each disk file, data is recorded in 128 positions of a movable arm by 32 read/write heads on 16 disk surfaces (2 head/surface, 128 track/head). Data organization of each of the 256 data tracks per surface is determined by the requirements of the system in which the file is to be installed, Collins said.

For a system organized to store 64 sectors of 128 bytes each, the data storage capacity is 8,192 byte/track; 2,097,152 byte/disk surface, and 33,554,432 byte/disk drive unit, Collins added.

The device uses the self-clocking phase modulation recording method and has a track width of 5 mils. Track spacing is 8 mils, according to Collins.

The 9200 disk file has a minimum head positioning time of 6 msec with a maximum time of 30 msec. The random average head positioning time is 19.5 msec and the latency average is 12.5 msec with a maximum of 25 msec.

The file has a rotational speed of 2,400 rpm and features a serial by bit transfer rate of 2.78 million bit/sec (348 kilobyte/sec) nominal between disk drive unit and control unit.

Reliable arm positioning with a minimum of moving parts is obtained from a linear electric motor mechanism operated under servo control with 7-bit binary commands and optical sensing, the firm stated.

The 9200A-1 OEM disk file includes an interface control unit, servo unit, and power supplies as well as the actual disk drive unit, company sources added.

The interface control unit provides linear driver/line terminators for communication with the controller over a data bus type interface. Each input/output signal is transmitted over a data bus common to the controller and the up to eight disk files on the system.

The control unit receives and compares the unit address for file selection as well as receiving track address and head address for controlling head position.

The 9200A-1 can operate over a 50°F to 90°F temperature range and a humidity range of 20% to 80%, the firm claimed.

Deliveries will begin in the first quarter of 1971.

Prices vary from $39,000/unit in quantities of one to nine disk files, down to $23,500/unit in quantities of 100 and more files.

Magnetic Flying Heads Set For Disks by Nortronics

MINNEAPOLIS – Availability of magnetic flying heads and assemblies for computer disk storage systems has been announced by Nortronics. Designs for both low- and high-density systems and for either large fixed disks or smaller removable disk packs are available.

Two single channel type designs, for use with IBM 2311, IBM 2314 disk drives, or equivalent OEM units, are currently in production.

For the low density Model 2311 system, the Nortronics flying heads have a recording density of 1,100 bit/in. (disk speed 2,400 rpm). For the high-density Model 2314 system, Nortronics flying heads offer recording density of 2,200 bit/in. (disk speed 2,400 rpm).

Typical characteristics are: write current of 35 mA zero to peak per leg on tracks 000 to 127 and 28 mA zero to peak per leg on trakcs 128 to 200; saturation current of 27 to 32 mA zero to peak per leg on track 000 with 20 to 26 mA zero to peak per leg on track 200.

Other characteristics are: 40 mA DC erase current; 390±25 grams head load; read/write core width of 0.0070 in. + 0.0000 - 0.0005 in.; read output of 9 mV peak to pesk maximum at 1.25 MHz and 6 mV peak to peak maximum at 2.50 MHz on track 000, and 3 mV peak to peak minimum at 1.25 MHz and 1.1 mV peak to peak minimum at 2.50 MHz. Resolution is 0.33% minimum, on track 200, measured by the 2.5 MHz output as a percentage of the 1.25 MHz output.

According to Nortronics, it is able to design and produce flying heads and assemblies for new computer disk storage systems still in the planning stage. Prototype head delivery cycles are approximately six to eight weeks for special units and production quantities of such units can be shipped within 90 days.

Prototype prices are $150/head, production prices of heads in quantities are as low as $40 each.

Nortronics Company, Inc. is at 8101 Tenth Avenue North.

Power Supplies Turn Off Voltage Automatically

NORTHRIDGE, Calif. – Damage to a CRT caused by grid bias failure can be prevented by a power supply from Advanced High Voltage Co. that turns off the high voltage automatically.

High-voltage CRT supplies are built to MIL specifications (MIL-E-5400, MIL-P-81279, MIL-STD-704 and others) with Hi-Rel components. Predicted MTBF is 50,000 hr.

Prices start below $200 in production quantities, depending on options. Delivery is normally four weeks ARO.

Advanced High Voltage Company, Inc. is at 8635 Yolanda Ave.

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At least one 10 year old beat the Nuclear Data, Inc. mini at chess.

Computer Transmission Corp.'s Optran infrared transceiver/data set gets once over after winning industrial design award.

Datascan Inc. displayed its Mark V paper tape reader.

An industrial design award went to Data Products Corp. for its 6040 disk file.

DEC PDP-8/OEM Brings Price Of Minicomputer Under $3,000

LOS ANGELES, Calif. – Digital Equipment Corp. (DEC) chose the Wescon show here to introduce a new model of the PDP-8 that lowers the price of minicomputers to below $3,000 in OEM quantities.

The unit forcing the breakthrough, the PDP-8/OEM, is a lower cost model of the PDP-8/E, a 12-bit machine that was introduced last month [CW, July 15] and first shown at Wescon.

The PDP-8/OEM has the same central processor as the 8/E, according to DEC. It differs in that it is designed for the OEM, who, in many instances, requires less than the 4,096 words of core memory standard in the PDP-8/E.

The base price for the central processing unit with 256 words of ROM and 256 words of read-write memory is $3,250 for single units. In quantities of 100, the price drops to $2,800.

"The PDP-8/OEM concept permits the OEM to configure the logic and computational power requirements of his particular system on a full scale PDP-8/E and then submit his specifications to us for custom design and manufacturing," Howard O. Painter, sales manager for the product line, explained. "This means he can tailor his system to his specific requirements, at the lowest possible cost."

The base price includes a PDP-8/E central processor, 1.2 µsec memory, a power fail detection and restart device, a basic panel, combination power supply, chassis, and the DEC Omnibus internal bus system that allows peripherals to be interfaced in any of 20 available slot positions in the central processor.

The basic panel is similar to the panel introduced on the PDP-11/15 [CW, Aug. 5[and is substituted for the programmer's control panel found on the PDP-8/E.

The PDP-8/OEM permits the OEM to expand his system in small increments and to avoid the purchase of unnecessary hardware, DEC said. Options available with the new model include increments of 256 and 1,024 word ROM units at prices of $800 and $1,500 each, respectively. Price of 256-word increments of read/write memory is $1,000 up to a maximum of 32K for both memories.

Highly Efficient

William H. Long, PDP-8 product line manager, said: "The low cost of the PDP-8/E and the OEM model is a direct result of their highly efficient mechanical and electrical design." The PDP-8/E relies heavily on medium-scale integrated circuits whenever possible – there are 50 MSI/TTL arrays in the processor alone.

Cost reduction also was aided substantially by the elimination of back panel wiring, an expensive manufacturing process. This was accomplished by the development of the Omnibus, an assembly of printed circuit edge connectors backed up by a printed circuit board with the assembly wave soldered.

Potential uses of the PDP-8/OEM include industrial control, data acquisition, data communications, and other areas where the PDP-8 family of small computers are found. More than 8,000 PDP-8s have been sold and are currently in use.

Paper Predicts Future of T/S Firms: Only 10 to 12 Efficient, Fast Services

LOS ANGELES – "In the future, the vast number of time-sharing firms will be diminished to 10 to 12 stable, efficient, and fast time-sharing services," according to a paper presented during a session entitled "Evaluation of Time-Sharing Services" here at Wescon.

The paper, a combined project of M.J. Quint of Hoffman Electronics Corp., B. Sangster of GE, R.H. Schmiederer, security Pacific National Bank, and B. Spinrad, Development Research Associates, predicted that the remaining services will be dominated by international systems.

Such international systems, the authors predicted, will have a full utility capability with time-sharing, remote batch, and batch processing modes available.

The systems will use silent terminals, and CRTs with hard copy capability for the majority of the terminals. I/O will also be available through card readers, optical scanners, and magnetic tape cassettes, they projected.

The main determinant in establishing this type of system will be the development of a separate data transmission system independent of the present telephone system, the authors said. They noted that such systems were being proposed using pulsed code modulation techniques over microwave equipment.

With the introduction of the services of the future, a new pricing scheme will come into common use in the T/S industry, they forecast. The new prices will probably take the form of an hourly rate and a flat rate or charges per dedicated part arrangements, they said.

Users Should Communicate

Jerome L. Zaharias, head of the applications section of the data computation branch of the Naval Weapons Center in China Lake, Calif., encouraged time-sharing users to get together at the session in order to communicate more effectively.

Effective communication among users of unique applications, programs and time-sharing techniques would greatly enhance the evaluation process of different T/S services, he said.

"Sessions over a glass of beer,"

(Continued on Page 35)

Exhibitors Taking a Gamble at Wescon

(Continued from Page 29)

The only other computer-related conference held on the Coast this year was the Data Processing Managers' Association's conclave in Seattle, but most of the firms represented at Wescon did not attend.

"DPMA would not have attracted the OEM community, and that's what we want to reach on the Coast," one said, adding, "anyway, it was pretty much of a bomb, from what I have seen."

Another manufacturer, observing the light first day crowds at the Hollywood Park site of the computer exhibits, told CW: "We can't say for sure yet, but if the show keeps up like this we will probably limit our participation to the Fall Joint when it moves back out to this area in 1971." The FJCC is scheduled for Las Vegas that year.

DEC had another reason for being at Wescon besides the West Coast exposure. As one spokesman said, "We are one of the few mini manufacturers with any money to spend, and we might as well make a big push now."

Machines Unseen

While there were few computers in evidence in the computer section of the exhibits – a Wang 3300, Raytheon 704, and DEC PDP-8/E – there were plenty at the show.

A quick walk through the production and test section of the exhibit hall showed how these OEMs have taken the computer to heart for their applications.

In all, there were over 20 production and test systems that incorporated one of DEC's line of computers and many of the other mini manufacturers were also represented.

While most of the noise at the show was in the mini market, both on the floor and in the session, time-sharing firms were represented by Computer Sciences Infonet Division and Call-A-Computer, both displaying engineering-related services to the primarily engineering-oriented audience. OEM keyboard manufacturers such as SCM and Singer were also receiving fairly good play from the light crowds.

The gamble has been taken and in the long run it may pay off for some of the firms at Wescon, for some of the attendees, and for the show itself. But first reports are definitely mixed.

DEC Shows PDP-11 Interface; Tennecomp Introduces Transport

By Drake Lundell
CW Computer Industry Editor

LOS ANGELES – New product action in the computer area at Wescon centered primarily on the leading minicomputer manufacturer – Digital Equipment Corp. (DEC).

In addition to the firm's announcement of a new member for the PDP-8/E family, it also introduced a communications line interface for the PDP-11, and Tennecomp Systems outlined a new mass storage device for the PDP line of computers.

PDP-11 Interface

The new asynchronous line interface for the PDP-11 line is the first of its type offered by DEC and is available for any model PDP-11, according to the firm.

The fully buffered unit, designated the DC-11, is meant to connect the PDP-11 to a variety of asynchronous terminals or to another computer through common carrier communications facilities, the firm said.

As an alternative, the communications facility can be bypassed and the terminals coupled directly to the computer through the device. A variety of terminals can be interfaced with the unit, DEC said, and line speed, character size, stop code length, and data set control lines can be varied by the programmer. I/O speed can also be varied independently, the firm added.

The DC-11 includes the necessary control signals and levels to interface with Bell 103 and 202 modems or their equivalent. One of four clock rates is selectable by program control, with clock rates of 110, 134.5, 150, 300, 600, 1,200 and 1,800 bit/sec available.

Character size, which is variable under program control, can be 5, 6, 7, or 8 bits. Stop code for the device is programmable to 1 or 2 bits, DEC said.

Serves as Multiplexer

The unibus bidirectional bus structure of the PDP-11 can serve as a multiplexer for adding interfaces and each two interfaces require a single unit. According to DEC, there is room for four DC-11 line units in one tabletop PDP-11.

Deliveries of the units are scheduled for November. A DC-11 system with clock (for mounting two module sets) is priced at $250 and module sets cost $600 each.

The use of the DC-11 is "not restricted to data communications," according to DC-11 marketing manager Donald Alusic. He said it could be used in a variety of operations such as data acquisition and control, numerical control of machine tools and to configure a small time-sharing system around the PDP-11.

Tennecomp Systems, Inc., Oak Ridge, Tenn., which was exhibiting for the first time at a major show, displayed its TP-1351 magnetic tape transport and outlined to CW plans for a dual transport tape unit which will be introduced at the Fall Joint Computer Conference if not before.

While the present single transport unit features a transfer rate of 3.7K bit/sec, the new dual transport unit will have a transfer rate of 4.5K bit/sec.

CW Covers Wescon

The single transport on display is designed to operate with DEC's PDP-8, PDP-9, PDP-11, and PDP-15 lines of computers. The new dual unit will operate with the PDP-8/L initially, but will be configured to operate with the entire PDP line. In addition, both units will be available in configurations for use with other manufacturers' minicomputers in the near future, a company spokesman said.

The single transport TP-1351 features a 3.7 kHz bit transfer rate and the ability to simulate a 4-track disk by means of a programmable track select option. It uses a tape cartridge with a word storage capacity of 256K.

Information is recorded in the unit in a bit-serial mode on a single track and tracks are selected manually or by program control with an automatic track select option. Software includes basic read and write routines plus DEC compatible PAL-III and EDIT-8.

The basic TP-1351 system with the transport, interface and software is priced at $1,990 and the power supply costs $140 and the I/O cables are priced at $160. OEM discounts run 10% for over 10 units, 25% for over 50 units, and 30% in 100 to 299 unit quantities.

The new dual transport unit scheduled for introduction soon, combines two of the transports in the TP-1351 system with one controller providing for over one-half million 12-bit words of off-line storage for the DEC machines.

The unit, which like the one transport device, will have a one-year warranty, will feature the automatic track select as a standard, instead of an option, standard power supply, and the same software.

It will be priced at $3,600 and will also feature an OEM discount schedule similar to the one above.

Other New Products

RCA was the other major firm making a series of new product announcements at Wescon – in the computer field as well as in others.

The firm's Solid State Division introduced a new gallium arsenide infrared emitting diode for application as an emitter in the sensors used in peripheral equipment.

The 40736 type IR emitting diode was designed to offer a sensor source with solid state reliability, according to Robert Felmly, marketing manager for solid state optoelectronics products.

In addition to replacing bulbs in peripheral equipment, the units should find applications in tape and card readers, he said. They are available immediately at $4.50 each in 1,000 lot quantities.

The same RCA division also announced a family of 7-segment decoder/driver MSI integrated circuits for use with low-voltage display devices at the show.

The CD2500E series consists of four basic types: the CD2500E and 2502E include decimal point driving circuits and are specified at 30 mA/sec and 80 mA/sec respectively; the 2501E and 2503E include a ripple-blanking circuit plus an intensity control provision in place of the decimal point option.

All of the units are compatible with TTL and DTL devices and are packaged in 16-lead dual-in-line plastic packages. 'Prices range from $4.50 to $5 depending on configuration in 1,000 lot quantities.

Another first was announced by Calcomp with the introduction of its first leadscrew-driven plotter. The unit – dubbed the Model 745 – was shown as part of a total integrated circuit design verification and mask production system.

The unit features a 4 ft by 5 ft drafting area on a one-piece granite table with less than .0002 IN. variation across its surface.

Other components in the IC system are the Calcomp Model 1136 drum plotter for design verification plotting and the Calcomp Model 900 controller with a Model 937 mag tape unit.

Interchangeable program tape cartridges for the Model 900 controller are said to facilitate switching from verification plotting on the 1136 to mask cutting on the 745, which cuts circuit masks using the Calcomp strippable film cutter.

Paper Predicts T/S Companies Will Diminish

(Continued from Page 34)

he said, "might provide the right atmosphere and environment for planting the seeds that will produce great strides in time-sharing."

In order to determine the cost of various time-sharing services in operation today, Arthur H. Wehry of Tridea Electronics said a firm should run its typical programs on several systems at the same times.

He noted that the pricing in the industry varies considerably as does the service. For example, he said that the same problem run on one 1108 service took approximately four minutes, while the same problem run on another 1108 service took 68 minutes.

Victor O. Muglia, Hoffman Electronics Corp., indicated that cost should not be the sole reason for selecting a T/S vendor. He said the user should evaluate the availability and reliability of the service also.

While without curves, Honeywell's table top card reader was an industrial design winner.

Miss Universe, Marisol Malaret, joined DEC's module marketing manager Bill Hogan at Wescon to review the firm's module line.

Computer Transceiver Systems terminals get work out at Wescon.

Xynetics Inc.'s automated drafting system was a design award recipient.

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Honeywell Proxy Statement

GE's Computer Unit Had $3.1 Million Loss in First Half

MINNEAPOLIS – The financial wraps have been removed from the computer business Honeywell has agreed to buy from GE, revealing only one profitable period among five years of steep losses.

A proxy statement to Honeywell shareholders, who will vote this month on the plan to merge computer operations, disclosed GE losses of more than $152 million from 1965-68 and a $3.1 million deficit for the first half of this year. The lone ray of light came in 1969 when GE's computer operations turned in a profit of $4.7 million on revenue of $411.6 million.

Urges Approval

In a letter to Honeywell stockholders, Chairman of the Board James H. Binger urged approval of the proposed merger and gave reasons for GE's severe losses.

In the course of obtaining an established position in the computer industry, he said, GE had experienced losses primarily on two fronts: the effect of organizing a worldwide base through the acquisition of the Bull and Olivetti computer interests, and the high development costs of GE's present line of computers.

"We are satisfied that the period of severe losses from these causes is over," Binger said, adding the combined operation "will, we believe, be the second largest force in the computer industry on a worldwide basis."

Including recent GE computer earnings figures, the proxy statement showed these operations had net losses of $39.6 million on revenue of $179.1 million in 1965, $55.8 million on revenue of $248.2 million in 1966, $42.5 million on revenue of $315.3 million in 1967, and $11.4 million on revenue of $357 million in 1968.

In the first half of 1970, unaudited sales and rental revenue for GE computer operations amounted to $204 million, compared to $193 million a year earlier. Net loss during the first six months of 1970 was $3.1 million, compared to $3.6 million a year earlier. The proxy statement said the improvement was achieved despite goodwill write-offs exceeding $31 million in connection with the acquisition of minority interests of an affiliated company.

$2.9 Million Gain

The statement further explained the 1969 net earnings profit of $4,7 million included an unrealized gain of $2.9 million resulting from the devaluation of the French franc and revaluation of the West German mark.

Finance

The year-to-year improvement in the operating results of GE's Computer Components business was primarily attributed to sales, service and rental income due to market growth and improved product performance; improvement in operations of foreign affiliates; and improved operating and financial controls and management effectiveness, the statement said.

Earnings figures for Honeywell during 1969 disclosed that $351 million, or 24% of its total revenue, came from its computer and communications group, up from $265 million, or 21%, a year earlier.

The Honeywell leader for 1969, however, was its aerospace and defense group, with $482 million in revenue.

Honeywell Information Systems Inc., the new company resulting from the merger, will be operated as a Honeywell subsidiary with Honeywell initially owning 81.5% and GE 18.5% GE will receive about $237.5 million in paper from Honeywell, comprising $110 million in notes and 1.5 million common shares of Honeywell.

The new subsidiary, encompassing all of Honeywell's computer operations, will have installed computer and related equipment at more than 10 installations in more than 35 countries having an original sales value of more than $3.5 billion, approximately $2.1 billion of which is on lease.

The combined operation will also amploy a substantial majority of tbe total domestic and international work force for both companies, numbering approximately 52,000 personnel.

In addition, GE will contribute its domestic computer operations; the stock in its Italian subsidiary, GE Information Systems Italia; its 25% direct interest in its British company, G.E.I.S. Ltd., and its 66% interest in Compagnie Bull General Electric, S.A.

Not included in the transaction are those GE operations providing time-sharing services in the U.S. and Canada, process-control computers and communications equipment.

More Competition

Honeywell's Binger sees the combined operation, because of its wider range of products and services available, as able to compete more strongly with IBM in terms of attracting and keeping customers and key personnel.

"Many benefits will stem from the magnitude of the combination," he said.

"Significant cost savings and economies of large-scale operation are expected, both through immediate elimination of a certain amount of duplication of effort and through the longer term integration of the two operations," he said.

Binger also noted that products could be developed and manufactured for a larger number of customers and distributed through a larger network of sales representatives so that development, engineering, production, marketing and associated overhead costs would be spread over the much larger revenue base.

"The higher density of computer installations should also result in savings in total field service expenses while improving service to customers," he said. "At the same time, substantially greater technical resources will be available to develop new product lines."

The combination is also complementary in a geographic sense, Binger mentioned. "Honeywell has traditionally concentrated its resources in developing and marketing medium-capacity computers, with strong sales coverage in the U.S., Canada and the UK, while GE's newest computers have been at the larger and smaller ends of the computer spectrum, with greater marketing strength in Western Europe and in Latin America.

"The cost savings and economies to be realized should thus be even further enhanced."

Honeywell Cuts Workers In Massachusetts by 2%

WELLESLEY HILLS, Mass. – The current economic slowdown has resulted in a more than 2% cutback from Honeywell's total Massachusetts work force.

Announcing a cutback of 106 employees at the firm's Lowell plant and 123 at its Brighton facility, Robert P. Henderson, vice-president and general manager of Honeywell's Electronic Data Processing Division, attributed the move to adjustments in the division's manufacturing operations. "We are trying to bring our work force in line with expected manufacturing volume for the second half of 1970," Henderson said.

Employing approximately 10,000 persons at 10 facilities within the state, Honeywell said earlier it planned to consolidate a few production operations of its minicomputer division, resulting in the cutback of 46 additional employees.

Datronic Rental Revenues Rise; Unit Losses Cited for Decline in Net

PALO ALTO, Calif. – Datronic Rental Corp., a DP equipment manufacturing, leasing and software firm, has announced higher revenues and slightly lower net earnings for the 1970 fiscal year ending June 30, 1970.

Consolidated operating revenues for the fiscal year rose to $3,091,099, an 11% increase from the $2,779,211 of fiscal 1969. Net profit for the year decreased to $244,349 or 36 cents per share, from the comparable $259,956 or 44 cents per share for the previous fiscal period.

Outstanding shares increased 14% to 678,789 from the previous fiscal year's weighted average shares of 594,064 as a result of the company's last underwriting.

The decline in net income was occasioned by losses in the company's subsidiary, Datronic Service Corp., the company said. The adverse effect on earnings was 20 cents per share. As a consequence of the poor showing by the subsidiary, operations were substantially curtailed and future losses minimized. A company spokesman said the continued operation of this subsidiary in the near future will have only insignificant effect on fiscal 1971's earnings.

Earnings suffered an additional reduction of 3 cents per share as a result of recent changes in Federal Income Tax treatment on Investment Tax Credits. Although the company has substantial Investment Tax Credits available, the amount of allowable deductions have been reduced for reporting purposes this year and the carry-forward period has been extended.

CSC Receives Contract Extension From Atomic Energy Commission

LOS ANGELES – Computer Sciences Corp. (CSC), a large independent company in the information and systems sciences, has received a five-year contract extension, estimated at more than $18 million, from the Atomic Energy Commission.

Under the contract, initially awarded in 1965, CSC provides scientific computation and business data processing to the AEC and its contractors at the Richland, Wash., operations site. The value of services provided by CSC totaled $18.6 million during the last five years, and a similar level of funding, according to Maj. Gen. William T. Smith, vice-president of CSC's Atomic Energy Division, is anticipated during the next five-year period.

The AEC contract also calls for Computer Sciences to assist in the diversification of industry in the Tri-Cities area of Richland, Pasco and Kennewick, Wash.

Tracor Reports Earnings Drop For 2d Quarter

AUSTIN – Tracor Inc., a maker of computer peripherals, has reported a sharp drop in earnings for the second quarter, ending June 30.

The company said its revenues for the period were $17,604,000, down $1,908,000, compared to earnings of $21,374,000 for the same period a year earlier.

Frank W. McBee Jr., Tracor president, said the decline in business is related to the general economic slowdown and the effect of tapering off of the first production contract on the Mark 1A Penetration Aids Canister Subsystem for the Minuteman II missile.

"Tracor was notified this week that the company has been awarded a $14,447,000 contract for continued production of Mark 1A canister subsystems," McBee said. He reported that during the next 12 months Tracor will receive more than $8 million from this one contract.

McBee reported that Tracor experienced a second quarter net loss of $552,000, or 25 cents per share, compared to a net income of $377,000, or 17 cents per share, for the first quarter of the year.

Brandon Shows First Quarter Net Loss

NEW YORK – Brandon Applied Systems, Inc. first-quarter figures showed a net loss, for the period ended May 31, of $125,213. The New York-based data processing services company also announced negotiation of the sale of the assets of two of its subsidiaries, and a cost reduction program.

President Dick H. Brandon said an agreement was signed recently under which the operating assets and business of the Princeton-based book publishing subsidiary, Brandon/Systems Press, Inc. (B/SP), will be acquired by a subsidiary of the Auerbach Corp. for the Science and Technology, of Philadelphia, consultants in management and urban systems and publishers of the Auerbach Computer Technology Reports.

Brandon also said the company has reached agreement in principle for the sale of the operating assets and business of Public Data Processing Corp. (PDP), the Chicago-based service bureau subsidiary, to Input, Inc., another Chicago-based bureau.

Brandon stated that the company had continued to experience a negative cash flow during the first five months of the current fiscal year, and required working capital.

He said the PDP and B/SP sales had proven to be necessary because the company had tried unsuccessfully to raise equity funds in an "unfavorable environment." He said the total consideration for both contemplated sales would be approximately $565,000 payable in cash or by the assumption of current obligations plus an incentive royalty on designated book sales. The initial payments will meet a substantial part, but not all, of the company's cash needs, and additional assets will be sold so that it may meet such needs, Brandon said.

New Registrations

ELECTRONIC DATA PREPARATION CORP., 5315 14th St. West, Bradenton, Fla., a company engaged in. providing data preparation and related services and in marketing data processing related equipment and generalized computer programs for sale or laase, filed to ragister 140,000 shares of common stock. Proceeds, at $5 per share maximum, intended for software product development, purchase of existing facilities, and down payment and related costs for a new facility; tha balance will be added to tha company's working capital and used for general corporate pruposes. No underwriter is involved.

AUTOMATED INFORMATION SYSTEMS, INC., 1064 River Road, Edgewater, N.J., a company organized for the purpose of designing and developing an integrated business accounting system intended to meet the general needs of business and industrial firms, has filed to register 250,000 shares of common stock and 125,000 common stock purchase warrants; aach unit consisting of two shares and one warrant. Tha proceeds, at $12 per unit, intended for use with "Ultimacc" (a minicomputer, peripheral aquipment and program package designed to serve various accounting, management information and bookkeeping functions), for the modification and development of new hardwere features and interfaces, and for the development of additional special purpose computer systems and program packagas, for additional research, the balance will be added to the company's working capital. The underwriter is Sherwood Securities Corp., 17 Battery Pl., New York.

TIME SHARING SCIENCES INC., 1180 Avenue of the Americas, New York, a company engagad in the development of a computer-indapendent data concentrator that would permit the connection of several T/S terminals to a computer through a single connection without modification of tha computer's hardwara or operating systam, has filed to register 100,000 shares of common stock. Proceeds at $5 par share, intended for completion of tha design and development of prototypes, and tha manufactura of production prototypes of tha data concentrator; the balance will be added to the company's general funds. Tha underwriter is R.A. Wolk & Co., Inc., 405 Lexington Ava., New York.

COMPUMATRICS INTERNATIONAL MANAGEMENT CORP., 220 Park Ave. South, Naw York, a company engaged in the marketing of management information systams and of computerized management tachniques, has filed to register 160,000 shares of common stock and 80,000 common stock purchase warrants, to be offered for sele in units, each consisting of two sharas and one warrant. Tha proceeds, at $10 per unit, intended for acquisition of Designers 3, Inc., for marketing of the company's proposad franchise centers, for purchase and modification of computer and managament information programs, and for development of financial and economic survay programs; the balance will be addad to tha company's working capital and used for genaral corporata purposes. The undarwritar is Lahman, Bartel & Co., Inc., 30 E. 60th St., New York, and Andraw A. Pilato, 258 Wyckoff Ava., Ridgewood, N.Y.

Automatic Data Boosts Net 48% in Fiscal '70

NEW YORK – Automatic Data Processing Inc., the Clifton, N.J.-based company has reported that its net income for fiscal year 1970, ended June 30, rose 48% to nearly $3.4 million, from almost $2.3 million a year earlier.

Gobbling up seven small EDP centers in cities where the company had no data processing services previously, Automatic Data Processing reports its revenue increased 35% to $39.1 million from just under $29 million a year before. Three other acquisitions were made during fiscal 1970. However, Frank R. Lautenberg, the firm's president, said they added only $2 million to fiscal 1970 revenue and didn't contribute to earnings.

"Our sales," Lautenberg indicated, "continue accelerating at a higher rate than last year. We expect earnings for fiscal 1971, based on present conditions, to be up substantially from fiscal 1970."

Automatic Data Processing, Lautenberg said, presently provides data processing services at computer centers in 16 major cities throughout the country. "We would like to be in 22," he said.

Hewlett-Packard Earnings Drop, Sales Increase

PALO ALTO, Calif. – Poor domestic sales continue tripping up Hewlett-Packard Co., as the firm reported fiscal third quarter earnings fell to $5.5 million, from $6.1 million a year earlier. However, the slip was holstered hy a 19% increase in international orders, thus hiking overall sales to $88.1 million from $82.7 million a year earlier.

In the nine months ended July 31, Hewlett-Packard earned $17.3 million, down from $17.8 million, a year earlier. Sales rose to $262.1 million from $234.7 million.

William R. Hewlett, president, blamed the poor earnings on "a general softness in our domestic markets," adding, "it is doubtful that we can expect much improvement in our business during the remainder of the fiscal year."

Ampex Profits Tumble; Roberts Cites Slump

REDWOOD CITY, Calif. – Depressed economic conditions and heavy new product line costs have caused a near $2.5 million tumble in Ampex Corp.'s fiscal first quarter earnings. Sales also fell $4.1 million.

President William F. Roberts blamed the drops on the current economic climate, which reduced orders, and on substantial start-up expenses for several new product lines.

Roberts predicted, however, that production lines should reach full levels "at the end of the second quarter and generate improving sales and earnings in the last half of the year."

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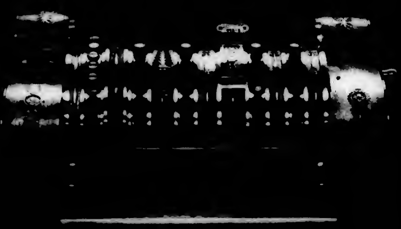

Position Announcements

DATA PERSONNEL, INC.
of KANSAS CITY

has career positions in the midwest. Contact: Data Personnel, Inc., Suite 2025 Ten Main Center, Kansas City, Missouri 64105 816-421-5313. National affiliation with other D.P. qualified personnel agencies welcomed.

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Computerworld Stock Trading Summary

All statistics compiled, computed and formatted by TRADE*QUOTES Division of National Information Services, Inc. Cambridge, Mass. 02139

CLOSING PRICES THURSDAY, AUGUST 27, 1970

SOFTWARE & EDP SERVICES

EXCH		1970 RANGE (1)	CLOSE AUG 27 1970	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 6	1 1/2	+ 1/4	+20.0
A	APPLIED DATA RES.	4- 24	5 1/2	- 1/8	-2.2
D	APPLIED LOGIC	2- 19	1 3/4	- 1/2	-22.2
O	ARIES	1- 8	1 1/8	+ 1/8	+10.0
A	AUTOMATIC DATA PROC	21- 47	14	+6 1/2	+23.6
D	AUTO SCIENCES	1- 14	3 1/2	- 1/4	-17.6
O	BRANDON APPLIED SYS	1- 9	1	0	0.0
O	COMPUTER AGE INDUS.	1- 3	7/8	- 1/8	-12.5
A	COMPUTER APPL	2- 12	2 5/8	+ 5/8	+11.2
O	COMPUTER ENVIRON	3- 14	3	+ 1/4	+9.0
N	COMPUTER INDUS.	2- 10	4	+1	+33.3
O	COMPUTER NETWORK	3- 14	7 1/2	+1 1/4	+20.0
O	COMPUTER PROPERTY	5- 15	6	+ 1/4	+14.2
N	COMPUTER SCIENCES	6- 34	7 1/4	+ 7/8	+12.7
O	COMPUTER USAGE	2- 8	2 1/2	- 1/2	-16.6
A	COMPUTING & SOFTWARE	16- 75	22 1/2	+3 5/8	+19.2
O	COMRESS	2- 10	2 1/4	+ 1/8	+5.8
O	COMSHARE	3- 15	3	- 1/8	-4.0
D	CONSOL. ANAL. CENT.	1- 3	1 1/8	+ 1/4	+28.5
O	DATA AUTOMATION	1- 24	3 1/8	+1 1/4	+66.6
O	DATA PACKAGING	5- 29	6 1/2	+ 3/4	+13.0
O	DATAMATION SERVICE	1- 6	1 3/8	+ 1/8	+10.0
U	DATATAB	5- 9	4 3/4	- 1/4	-5.0
O	DIGITEK	2- 5	2	- 1/8	-5.8
O	EDP RESOURCES	5- 13	5 1/4	+1 1/4	+27.7
A	ELECT COMP PROG	3- 11	3 1/2	+ 5/8	+21.7
O	ELECTRONIC DATA SYS.	31-161	49 1/2	+6	+13.7
O	INFORMATICS	4- 21	8 3/8	+1	+18.6
A	ITEL	6- 26	9 7/8	+2 3/8	+31.6
O	LEVIN-TOWNSEND SERV.	1- 11	3 1/2	+ 3/4	+27.2
A	MANAGEMENT DATA	8- 25	9 3/4	+1	+11.4
O	NAT COMP ANALYSTS	1- 8	1 1/4	-1	-44.4
O	NAT.COMP. SERV.	3- 12	4 3/4	0	0.0
N	PLANNING RESEARCH	11- 54	19	+3 1/8	+21.5
O	PROGRAMMING METHODS	9- 27	10	+ 1/2	+5.2
O	PROGRAMMING & SYS	2- 5	2 1/4	+ 1/4	+12.5
O	PROGRAMMING SCIENCES	2- 31	2 1/8	+ 1/8	+6.2
N	SCIENTIFIC RESOURCES	2- 22	3 1/8	+ 5/8	+25.0
U	SOFTWARE SYSTEMS	1- 2	3/4	0	0.0
O	TBS COMPUTER CENTERS	6- 27	6 1/2	0	0.0
O	UNITED DATA CENTER	2- 4	2 1/2	- 1/8	-4.7
N	UNIVERSITY COMPUTING	14- 99	17 3/4	+2 5/8	+17.3
A	URS SYSTEMS	5- 21	5 1/8	0	0.0
O	U.S. TIME SHARING	3- 14	3 1/4	- 1/8	-1.7

PERIPHERALS & SUBSYSTEMS

EXCH		1970 RANGE (1)	CLOSE AUG 27 1970	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	21- 62	30	+4 1/4	+16.5
O	ALPHANUMERIC	2- 15	3 1/4	+ 3/8	+13.0
N	AMPEX CORP	13- 48	16 1/8	+1 5/8	+11.2
A	ASTRODATA	4- 34	4 7/8	+1 1/8	+10.0
O	BOLT,BERANEK & NEW	3- 11	6 3/8	+ 1/4	+4.0
N	BUNKER-RAMO	6- 14	7 3/4	+ 7/8	+12.7
A	CALCOMP	11- 31	13 3/8	+1 7/8	+16.3
O	COGNITRONICS	3- 13	3 1/4	+ 1/2	+15.3
O	COLORADO INSTRUMENTS	4- 13	6 1/2	+ 1/4	+4.0
O	COMPUTER COMMUN.	5- 36	8 3/4	+4	+84.2
A	COMPUTER EQUIPMENT	4- 12	3 7/8	0	0.0
A	COMPUTEST	11- 33	16 5/8	+2 7/8	+20.9
A	DATA PRODUCTS CORP	5- 26	7 1/2	+2 1/8	+39.5
D	DATA TECHNOLOGY	5- 23	5	- 3/8	-6.9
O	DIGITRONICS	4- 11	4 1/4	- 1/4	-5.5
N	ELECTRONIC M & M	7- 40	9 1/4	+2 1/4	+32.1
O	FABRI-TEK	1- 8	3 1/4	+ 1/8	+13.0
D	FARRINGTON MFG	2- 17	2 1/2	0	0.0
O	INFORMATION DISPLAYS	5- 20	4 3/4	- 1/2	-9.5
A	MARSHALL INDUSTRIES	14- 67	18 7/8	+2 7/8	+17.9
A	MILGO ELECTRONICS	15- 84	24	+3 7/8	+19.2
N	MOHAWK DATA SCI	19- 87	25 3/4	+6	+30.3
O	OPTICAL SCANNING	11- 52	18 1/2	+5 1/2	+42.1
O	PHOTON	4- 17	8 1/8	+ 7/8	+12.0
O	PHOTO-MAGNETIC SYS.	1- 4	1 1/8	- 1/8	-8.1
A	POTTER INSTRUMENT	15- 42	21 1/8	+4 3/4	+29.0
O	PRECISION INST.	6- 25	6 1/4	+ 1/2	+8.0
D	RECOGNITION EQUIP	13- 83	17 3/4	+2 1/2	+16.3
O	REDCOR CORP.	4- 34	5 3/4	+1 3/8	+11.4
N	SANDERS ASSOCIATES	7- 29	11 3/8	+2 1/8	+22.9
O	SCAN DATA	6- 53	6 3/4	+ 1/4	+3.8
O	TALLY CORP.	10- 23	10 3/4	+ 1/2	+4.8
N	TELEX	10- 25	11 5/8	+2 1/8	+22.3
O	VIATRON	2- 51	2 1/4	-2 1/4	-50.0

SUPPLIES & ACCESSORIES

EXCH		1970 RANGE (1)	CLOSE AUG 27 1970	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADAMS-MILLIS CORP	8- 15	11 3/4	+1 1/2	+14.6
O	BALTIMORE BUS FORMS	11- 21	10 1/2	0	0.0
A	BARRY WRIGHT	6- 25	7 3/8	+ 1/2	+7.2
A	DATA DOCUMENTS	15- 35	18	+ 1/4	+1.5
N	ENNIS BUS. FORMS	11- 19	12 7/8	- 1/4	-1.9
O	GRAPHIC CONTROLS	7- 17	7 1/4	+ 1/2	+7.4
N	MEMOREX	46-186	87 7/8	+16 3/4	+32.7
N	3M COMPANY	71-114	87 3/4	+6 1/4	+7.8
O	MOORE BUS. FORMS	27- 38	31 1/2	+2 1/8	+7.2
N	NASHUA CORP	21- 43	27 3/4	- 5/8	-2.2
O	REYNOLDS & REYNOLD	25- 48	28 1/2	+ 1/2	+1.7
O	STANDARD REGISTER	17- 30	20	+1 3/4	+9.5
N	UARCO	22- 39	24 3/4	+1 1/4	+5.3
A	WABASH MAGNETICS	7- 30	8 1/4	+1 1/4	+17.8
O	WALLACE BUS FORMS	25- 41	36 1/4	+3 1/4	+9.8

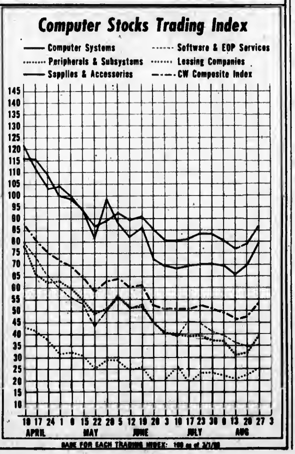
COMPUTER SYSTEMS

EXCH		1970 RANGE (1)	CLOSE AUG 27 1970	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	78-173	103 3/4	+11 3/8	+12.3
N	COLLINS RADIO	9- 37	13 5/8	+2	+17.2
N	CONTROL DATA CORP	10-122	35 3/4	+3 1/4	+10.0
A	DIGITAL EQUIPMENT	50-124	69 1/2	+9 1/4	+15.3
N	ELECTRONIC ASSOC.	3- 11	5	+1 1/4	+11.3
A	ELECTRONIC ENGINEER.	3- 14	5 1/8	+ 7/8	+20.5
N	FOXBORO	18- 19	20 7/8	+1 7/8	+9.8
O	GENERAL AUTOMATION	9- 42	11 1/2	+2 1/2	+27.7
N	GENERAL ELECTRIC	60- 80	78 5/8	+2 3/8	+1.1
N	HEWLETT-PACKARD CO	19- 45	25 7/8	+4 3/8	+20.3
N	HONEYWELL INC	65-152	88 1/2	+7 3/4	+9.5
N	IBM	223-387	265 1/4	+20 1/2	+8.3
N	NCR	30- 86	39 1/4	+6 7/8	+21.2
N	RCA	18- 34	24	+ 1/4	+1.0
N	RAYTHEON CO	16- 33	19 1/8	+1 5/8	+9.2
D	SCI. CONTROL CORP.	1- 8	2 3/8	+ 3/8	+18.7
N	SPERRY RAND	19- 40	22 3/4	+1 1/2	+7.0
A	SYSTEMS ENG. LABS	10- 49	13 1/4	+2 5/8	+23.5
N	VARIAN ASSOCIATES	9- 29	12 1/8	+1 3/4	+16.4
A	WANG LABS.	18- 51	27 5/8	+1 1/4	+11.3
N	XEROX CORP	66-115	78 3/8	+5 7/8	+8.3

LEASING COMPANIES

EXCH		1970 RANGE (1)	CLOSE AUG 27 1970	WEEK NET CHNGE	WEEK PCT CHNGE
D	BOOTHE COMPUTER	8- 25	10 1/4	+1 1/4	+13.8
O	BRESNAHAN COMP.	3- 9	1 1/4	+ 3/4	+30.0
O	COMPUTER EXCHANGE	2- 8	4 3/4	- 1/4	-5.0
O	COMPUTER LEASING	3- 18	2 1/2	-2 1/2	-50.0
N	DATA PROC. F & G	6- 12	11 1/4	+3 1/8	+38.4
O	DATRONIC RENTAL	2- 8	2 5/8	+ 1/8	+5.0
A	DEARBORN COMPUTER	10- 24	15 3/4	+2	+14.5
O	DIEBOLD COMP. LEAS.	2- 8	4 1/2	+1 3/8	+44.0
A	DPA, INC.	3- 10	4 3/8	+ 1/2	+12.9
A	GRANITE MGT	7- 22	10	+1 1/2	+17.6
A	GREYHOUND COMPUTER	5- 44	7 1/4	+2 1/8	+41.4
N	LEASCO DATA PROC.	7- 30	10	+1 5/8	+19.4
D	LECTRO COMP LEAS.	2- 9	9 1/8	+7 1/8	+356.2
A	LEVIN-TOWNSEND CMP	3- 19	5 1/2	+1	+22.2
D	LMC DATA, INC.	1- 3	1 1/8	0	0.0
U	MANAGEMENT ASSIST	1- 4	1 5/8	+ 1/8	+8.3
O	NCC INDUSTRIES	3- 8	3 3/4	+ 1/8	+3.4
O	SYSTEMS CAPITAL	2- 8	1 7/8	- 3/8	-16.6
A	U.S. LEASING	3- 19	13	+1 3/4	+15.5

EXCH: N=NEW YORK EXCHANGE; A=AMERICAN EXCHANGE
L=NATIONAL EXCHANGE; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR


Computer Stocks Trading Index

BASE FOR EACH TRADING INDEX: 100 as of [illegible]

Earnings Reports

COMPUTER INVESTORS GROUP
Three Months Ended June 30

	1970	a1969
Shr Ernd	$.14	$.09
Revenue	2,410,550	1,550,909
Earnings	285,624	173,802

a-Restated by company.

COMPUTER PROPERTY
Three Months Ended June 30

	1970	1969
Shr Ernd	$.18	$.29
Revenue	1,168,000	945,000
Earnings	120,000	197,000
6 Mo Shr	.31	.40
Revenue	2,249,000	1,696,000
Earnings	207,000	270,000

COMPUTER SCIENCES
13 Weeks Ended June 26

	1970	a1969
Shr Ernd	$.10	$.23
Revenue	26,710,000	22,693,000
Earnings	1,264,000	2,844,000

a-Restated to reflect acquisition on a pooling-of-interests basis.

EDP RESOURCES INC.
Year Ended April 30

	1970	1969
Shr Ernd	$.17	a$.59
Revenue	11,224,233	4,510,398
Earnings	124,784	346,077
Spec Cred	......	b197,855
Earnings	124,784	c545,932

a-Based on income before special credit. b-From investment credit, carryforward of prior period's operating losses of $154,100, and gain on purchase by the company of $750,000 principal amount of its 7-7/8% debentures of $43,755. c-Equal to 93 cents a share.

VICTOR COMPTOMETER CORP.
Three Months Ended June 30

	1970	a1969
Shr Ernd	$.19	$.58
Revenue	37,654,950	41,113,728
Earnings	1,032,968	2,967,816
6 Mo Shr	.49	.97
Revenue	77,264,657	76,380,552
Earnings	2,614,122	5,027,333

a-Restated by company.

TEXAS INSTRUMENTS INC.
Three Months Ended June 30

	1970	1969
Shr Ernd	$.84	$.79
Sales	221,450,000	200,526,000
Earnings	9,283,000	8,889,000
6 Mo Shr	1.57	1.43
Revenue	443,164,000	388,693,000
Earnings	17,347,000	15,634,000

INTERNATIONAL TIME-SHARING
Year Ended May 31

	1970	1969
Revenue	$1,603,660	$435,055
Loss	316,662	1,262,548
Spec Cred	a413,000	......
Earnings (Loss)	b96,318	(1,262,546)

a-From sale of time-sharing software to Control Data Corp. b-Equal to 5 cents a share.

PROGRAMMING AND SYSTEMS
Three Months Ended May 31

	1970	1969
Shr Ernd	$.04	$.03
Revenue	1,276,095	1,172,609
Earnings	127,558	105,120

PROGRAMMING SCIENCES
Six Months Ended May 31

	1970	b1969
aShr Ernd	$.03	$.01
Revenue	1,604,210	1,170,569
Tax Cred	36,000	14,000
Earnings	66,848	41,340

a-Reflect two-for-one stock split ratified May 15, 1970. b-Restated to reflect current accounting practices. c-Equal to 5 cents a share in 1970 and 2 cents a share in 1969.

COMPUTER INSTRUMENTS
28 Weeks Ended July 17

	1970	1969
Revenue	$2,929,848	$3,914,973
Loss	157,801	168,270

LIBERTY LEASING CO.
Three Months Ended June 30

	1970	b1969
aShr Ernd	$.29	$.23
Revenue	8,891,000	6,885,000
Earnings	337,000	261,000
a6 Mo Shr	.41	.45
Revenue	18,054,000	12,645,000
Earnings	483,000	508,000

a-Based on average common shares to include contingent shares and common stock equivalents. b-Restated for change in accounting method of pooled entity.

ELECTRONIC CONTROLS INC.
Three Months Ended June 30

	1970	1969
Shr Ernd	$.04	$.02
Revenue	381,000	288,000
Earnings	14,500	8,000
6 Mo Shr	.11	.08
Revenue	729,000	596,000
Earnings	38,500	28,000

MetaCOBOL — COBOL

MetaCOBOL

```
PRINT BODY BY 2.
```

COBOL

```
WRITE BODY AFTER ADVANCING 2 LINES.
MOVE SPACES TO BODY.
ADD 2 TO LINE-COUNT.
IF LINE-COUNT IS GREATER THAN 56
  PERFORM PAGE-HEADING-ROUTINE
  MOVE ZEROS TO LINE-COUNT.
```

MetaCOBOL

```
CLEAR WORK-RECORD.
```

COBOL

```
MOVE SPACES TO WORK-RECORD.
MOVE ZEROS TO AMOUNT OF WORK-RECORD.
MOVE ZEROS TO HOURS OF WORK-RECORD.
MOVE ZEROS TO RATE OF WORK-RECORD.
```

MetaCOBOL

```
CANJOB THREE.
```

COBOL

```
ENTER LINKAGE.
CALL 'CANJOB' USING THREE.
ENTER COBOL.
STOP RUN.
```

MetaCOBOL

```
INPUT-FROM CARDS-IN
  INTO CARD-IN.
```

COBOL

```
    OPEN INPUT CARDS-IN.
    PERFORM ZZ-INIT-ZZ.
    GO TO ZZ-OPEN-ZZ.
ZZ-READ-ZZ.
    IF ZZ-LR-ZZ = 'N' CLOSE CARDS-IN STOP RUN.
    READ CARDS-IN AT END MOVE 'N' TO ZZ-LR-ZZ.
    GO TO ZZ-BREAK-ON-ZZ.
```

MetaCOBOL

```
LISEZ LA-CARTE,
  A LA FIN ALLEZ A SORTIE.
MULTIPLIEZ LES-HEURES PAR LE-TAUX
  POUR DONNER LE-SALAIRE.
DEPLACEZ PIERRE A COLETTE.
```

COBOL

```
READ LA-CARTE,
  AT END GO TO SORTIE.
MULTIPLY LES-HEURES BY LE-TAUX
  GIVING LE-SALAIRE.
MOVE PIERRE TO COLETTE.
```

MetaCOBOL

```
01  TRAN-SORT-KEY.  02 SEQ-KEY.
03  ACCT.  04 ACCT-KEY.
05  ACCT-NO P=X(10).
```

COBOL

```
01  TRAN-SORT-KEY.
      02  SEQ-KEY.
        03  ACCT.
          04  ACCT-KEY.
            05  ACCT-NO   PICTURE IS X(10).
```

MetaCOBOL™

A macro statement facility designed for peaceful coexistence with COBOL

The limitations of COBOL are well-known to anyone who works extensively with it. Rigid syntax; the frequent need for an excessive number of statements and for repetition of information common to many COBOL statements; and the general inflexibility which too often consumes valuable time for unproductive purposes, are just some of the undesirable characteristics that have been unavoidable till now.

Over the years ADR has been actively associated with the development and expansion of COBOL language and usage. Now, we have developed the logical and long needed improvement. MetaCOBOL: a unique macro statement facility to give you the best of COBOL plus the means to simplify and expand its use for your specific needs.

Here is how MetaCOBOL will function. It accepts standard COBOL and user-defined statements. and transforms them into a standardized format compatible with IBM/360 Level E, Level F, and ANS COBOL. It develops and invokes macro statements embedded in COBOL programs. It abbreviates existing COBOL required words and phrases, defines new verbs, simplifies writing multi-part verbs, eliminates the need for writing extensive data name qualifications. MetaCOBOL will also produce program listings in easier to read format, define a library of standard macros and abbreviations and help in debugging. It will produce report writing, information retrieval and other generalized programs from simple parameters. It will generate test data and supply output in source form.
In total, MetaCOBOL offers a new flexibility and the opportunity to significantly reduce time and costs in COBOL programming and coding. MetaCOBOL is operational! You can write in MetaCOBOL tomorrow. Contact any ADR office today.

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